

**Record of Decision**  
**Parker Flats Munitions Response Area**  
**Track 2 Munitions Response Site**  
**Former Fort Ord, California**

June 24, 2008

**United States Department of the Army**  
Base Realignment and Closure (BRAC)  
Former Fort Ord, California

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## **1. DECLARATION**

### **1.1. Site Name and Location**

The former Fort Ord is located in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The U.S. Environmental Protection Agency (EPA) identification number for Fort Ord is CA7210020676. This Record of Decision (ROD) addresses Munitions and Explosives of Concern (MEC), specifically unexploded ordnance (UXO) and discarded military munitions (DMM), that potentially remains in the Parker Flats Munitions Response Area (Parker Flats MRA), one of the Track 2 Munitions Response Remedial Investigation/Feasibility Study (Track 2 MR Remedial Investigation/Feasibility Study) sites at the former Fort Ord Army Base in Monterey County, California (Plate 2).

Since 1917, military units (e.g., cavalry, field artillery, and infantry) used portions of the former Fort Ord for training (e.g., maneuvers, live-fire) and other purposes. Because the military conducted munitions-related activities (e.g., live-fire training) on the facility, military munitions (e.g., UXO, DMM) may be present on parts of the former Fort Ord. The types of military munitions used at the former Fort Ord included: artillery and mortar projectiles, rockets, guided missiles, rifle and hand grenades, training land mines, pyrotechnics, bombs, and demolition materials. For the purposes of the Fort Ord Military Munitions Response Program (MMRP) being conducted and this ROD, MEC does not include small arms ammunition (.50 caliber and below). A Glossary of Munitions Response Program Terms is provided in Appendix A.

Track 2 sites are those sites where MEC was found and a MEC removal action was conducted. The Track 2 site known as the Parker Flats MRA contains portions or all of 13 Munitions Response Sites (MRSs) that were suspected to have been used for military training with military munitions (Table 1). These MRSs were investigated, with all MEC detected removed. These removal actions included Quality Control and Quality Assurance requirements that evaluated the adequacy of the removal action. The munitions response to MEC was designed to address MEC to depths of four feet below ground surface (bgs); however, all anomalies (i.e., ferromagnetic material), even those deeper than four feet bgs, were investigated with all MEC encountered removed within the Parker Flats MRA. All further statements in this document referring to "removals to four feet bgs" should be understood to include the prosecution of all detected anomalies to resolution, regardless of their depth bgs. Although MEC is not expected to be encountered within these MRSs, it is possible that some MEC may not have been detected and remains present. Because a future land user (e.g., worker, resident, or visitor) may encounter MEC at the Parker Flats MRA, the Army conducted the Parker Flats MRA Remedial Investigation/Feasibility Study to evaluate remedial alternatives to address this potential risk, which is considered low, to future land users.

### **1.2. Basis and Purpose**

This decision document presents the selected remedial action for MEC for the Parker Flats MRA MRSs. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendment and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information and reports contained in the Administrative Record for the former Fort Ord.

This decision is undertaken pursuant to the President's authority under CERCLA Section 104, as delegated to the United States Department of the Army (Army) in accordance with Executive



Order 12580, and in compliance with the process set out in CERCLA Section 120. The selection of the remedy is authorized pursuant to CERCLA Section 104, and the selected remedy will be carried out in accordance with CERCLA Section 121.

The Army and EPA have jointly selected the remedy. The California Environmental Protection Agency as represented by the Department of Toxic Substances Control (DTSC) has had an opportunity to review and comment on the ROD.

### **1.3. Site Assessment**

The response action selected in this Record of Decision is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances, or of pollutants or contaminants that may present an imminent and substantial endangerment to public health or welfare.

### **1.4. Description of the Selected Remedy**

The selected remedy described in this ROD addresses risks to human health and the environment from MEC that potentially remains in the Parker Flats MRA. A MEC removal has been completed at the Parker Flats MRA, significantly reducing the risks to human health and the environment. The selected remedy includes Land Use Controls (LUCs) because detection technologies may not detect all MEC present and some areas contain barriers (e.g., pavement, buildings) that, while providing protection against any MEC potentially present, preclude the use of detection technologies. These include: (1) MEC recognition and safety training for those people that use the property and conduct ground disturbing or intrusive activities; (2) construction monitoring for ground disturbing or intrusive activities; and (3) restrictions against residential use as described below. A Remedial Design/Remedial Action Work Plan (RD/RAWP) will be developed to: (1) outline the processes for implementing the land use restrictions selected as part of the remedy; and (2) identify procedures for responding to discoveries of MEC, including coordinating a response to a future discovery of a significant amount of MEC in the Parker Flats MRA. The selected LUCs may be modified in the future based on the five-year review process.

The preferred remedial alternative of LUCs as described in the Final Parker Flats MRA Feasibility Study (Volume III; *MACTEC*, 2006) did not include restrictions against residential use. However, in its October 18, 2006 letter DTSC stated "...it would be appropriate to establish land use restrictions to assure the property will not be used for residential or other sensitive uses without further investigation" in addition to the two other elements of the LUC alternative (*DTSC*, 2006b). In a letter dated October 16, 2006, EPA requested that the Army include a residential restriction in the preferred remedial alternative to ensure that, prior to residential use, the area is "reviewed again" (*EPA*, 2006). Based on the Remedial Investigation/Feasibility Study, the Army's position is that the additional layer of protection provided by a residential use restriction is not necessary for the Parker Flats MRA; however, in consideration of regulatory input, the preferred remedial alternative includes a LUC prohibiting residential use as described in this ROD. For the purpose of this decision document, residential use includes, but is not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (*Army*, 2007b). Any proposal for residential development in the Parker Flats MRA will be subject to regulatory review. It should be noted that, per the Fort Ord Reuse Authority (FORA) Fort Ord Base Reuse Plan (*FORA*, 1997), only the "development reserve" (Reuse Areas 5a and 5b on Plate 2 and Table 2) could include residential development as a potential future use.

As part of the LUC implementation strategy, Long Term Management Measures comprised of a deed restriction, Covenants to Restrict Use of Property (CRUPs), annual monitoring and reporting, and five-year review reporting would be included for all land use areas within the Parker Flats MRA. The Army

will provide a deed restriction that: (1) informs future property owners that MEC was found and removed from the area; (2) informs future property owners about the selected remedy; and (3) outlines appropriate procedures to be followed in the event that MEC is encountered. The Army will also enter into State Land Use Covenants that document the land use restrictions selected as part of the remedy. The Army will also perform annual monitoring both for MEC and changes in site conditions that could increase the possibility of encountering MEC and report such findings. The Army will notify the regulatory agencies, as soon as practicable, of any MEC-related data identified during use of the property, and report the results of monitoring activities annually. The Army will also conduct five-year reviews.

Although the Army determined that there were no potential Federal or State applicable or relevant and appropriate requirements (ARARs) that relate to LUCs at the Parker Flats MRA, LUCs will be implemented in a manner consistent with Federal and State guidance. While the Army does not consider California laws and regulations concerning Land Use Covenants to be potential ARARs, after the Parker Flats MRA ROD is signed, the Army will enter into State Land Use Covenants that document the land use restrictions selected as part of the remedy. Although the DTSC and EPA Region IX disagree with the Army's determination that California laws and regulations concerning Land Use Covenants are not potential ARARs, they will agree-to-disagree on this issue if the Army signs State Land Use Covenants acceptable to the DTSC. Land Use Covenants signed by the Army and the State of California in the past restricting the land use of the property were acceptable to the DTSC.

### **1.5. Statutory Determination**

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost effective. A munitions response to MEC intended to remove the principal threats to human health and the environment at the Parker Flats MRA has already been completed. This meets the intent of using permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and satisfies the statutory preference for treatment as a principal element (i.e., reducing the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Because the selected remedy may not have removed all MEC potentially present within the Parker Flats MRA, a statutory review will be conducted within five years after initiation of the remedial action to ensure the remedy is, or will be, protective of human health and the environment. The next five-year review will occur in 2012.

### **1.6. ROD Data Certification Checklist**

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this site.

- Types of MEC identified during previous removal actions (Section 2.8. and Table 1).
- Current and reasonably anticipated future land use assumptions used in the risk assessment and ROD (Section 2.9.).
- The hypothetical baseline and current after-action "Overall MEC Risk Scores" estimated in the Risk Assessment before and after removal actions were conducted (Section 2.10.).
- The remedial action objectives for addressing the current after-action "Overall MEC Risk Scores" estimated in the Risk Assessment (Section 2.11.).

- How source materials constituting principal threats are addressed (Sections 2.12. and 2.13.).
- Potential land use that will be available at the site as a result of the selected remedy (Section 2.14. and Table 2).
- Estimated capital, annual operations and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (Section 2.14.).
- Key factor(s) that led to selection of the remedy (Section 2.15. and Table 3).

**1.7. Authorizing Signatures and Support Agency Acceptance of Remedy**

**Record of Decision  
Parker Flats Munitions Response Area  
Track 2 Munitions Response Site  
Former Fort Ord, California**

Signature Sheet for the foregoing Record of Decision for Parker Flats Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.



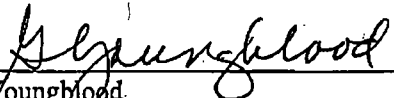
Addison D. Davis, IV  
Deputy Assistant Secretary of the Army  
Environment, Safety, and Occupational Health

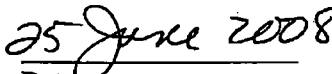
18 Aug 08

Date

**Record of Decision  
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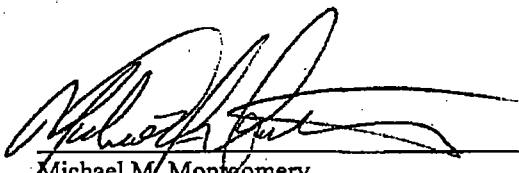
Signature Sheet for the foregoing Record of Decision for Parker Flats Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.

  
\_\_\_\_\_  
Gail Youngblood  
BRAC Environmental Coordinator  
Fort Ord BRAC Office  
U.S. Department of the Army

  
\_\_\_\_\_  
Date

**Record of Decision  
Parker Flats Munitions Response Area  
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Signature Sheet for the foregoing Record of Decision for Parker Flats Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.



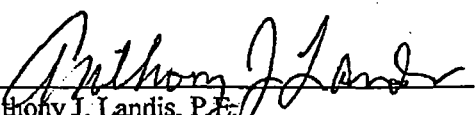
Michael M. Montgomery  
Chief, Federal Facilities and Site Cleanup Branch  
U.S. Environmental Protection Agency  
Region IX

8/26/08  
Date

**Record of Decision  
Parker Flats Munitions Response Area  
Track 2 Munitions Response Site  
Former Fort Ord, California**

Signature Sheet for the foregoing Record of Decision Parker Flats Munitions Response Area, Track 2 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.

The State of California, California Environmental Protection Agency Department of Toxic Substances Control (DTSC) had an opportunity to review and comment on the Record of Decision (ROD) and our concerns were addressed.

  
Anthony J. Landis, P.E.  
Supervising Hazardous Substances Engineer II  
Cal Center Cleanup Program  
California Environmental Protection Agency  
Department of Toxic Substances Control

7-22-08  
Date

## **2. DECISION SUMMARY**

### **2.1. Site Description**

The former Fort Ord is located near Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The former Army post consists of approximately 28,000 acres adjacent to Monterey Bay and the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Union Pacific Railroad and State Route 1 pass through the western portion of former Fort Ord, separating the beachfront from the rest of the Base. Laguna Seca Recreation Area and Toro Regional Park border former Fort Ord to the south and southeast, respectively, as well as several small communities such as Toro Park Estates and San Benancio. Additional information about the site:

- EPA Identification Number: CA7210020676;
- Lead Agency: Army;
- Lead Oversight Agency: EPA;
- Support Agency: DTSC;
- Source of Cleanup Monies: Army; and
- Site Type: Former Military Installation.

### **2.2. Site History**

Since 1917, portions of Fort Ord were used by cavalry, field artillery, and infantry units for maneuvers, target ranges, and other purposes. From 1947 to 1974, Fort Ord was a basic training center. After 1975, the 7<sup>th</sup> Infantry Division occupied Fort Ord. Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993 and the Base was not officially closed until September 1994. The property remaining in the Army's possession was designated as the Presidio of Monterey Annex on October 1, 1994, and subsequently renamed the Ord Military Community (OMC). Although Army personnel still operate parts of the Base, no active Army division is stationed at the former Fort Ord. Since the Base was selected in 1991 for Base Realignment and Closure (BRAC), site visits, historical and archival investigations, military munitions sampling, and removal actions have been performed and documented in preparation for transfer and reuse of the former Fort Ord property. The Army will continue to retain the OMC and the U.S. Army Reserve Center located at the former Fort Ord. The remainder of Fort Ord was identified for transfer to Federal, State, and local government agencies and other organizations and, since Base closure in September 1994, has been subjected to the reuse process. Some of the property on the installation has been transferred. A large portion of the Inland Training Ranges was assigned to the U.S. Department of the Interior, Bureau of Land Management (BLM). Other areas on the installation have been or will be transferred through economic development conveyance, public benefit conveyance, negotiated sale, or other means.

Munitions-related activities (e.g., live-fire training, demilitarization) involving different types of conventional military munitions (e.g., artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, practice land mines, pyrotechnics, bombs, demolition materials) were conducted at Fort Ord. Because of these activities, MEC, specifically unexploded ordnance (UXO) and discarded military munitions (DMM), have been encountered and are known or suspected to remain present at sites



throughout the former Fort Ord. A Glossary of Munitions Response Program Terms is provided in Appendix A.

### 2.3. Enforcement and Regulatory History

The Army is the responsible party and lead agency for investigating, reporting, making cleanup decisions, and taking cleanup actions at the former Fort Ord under CERCLA. Although munitions response has been completed at the Parker Flats MRA, and thereby significantly reducing the potential risks to human health and the environment, the reuse of the former Fort Ord following transfer of property increases the possibility of the public being exposed to explosive hazards. In November 1998, the Army agreed to evaluate military munitions at former Fort Ord in an Ordnance and Explosives Remedial Investigation/Feasibility Study (basewide OE Remedial Investigation/Feasibility Study now termed the basewide Munitions Response Remedial Investigation/Feasibility Study) consistent with CERCLA. A Federal Facility Agreement (FFA) was signed in 1990 by the Army, EPA, DTSC (formerly the Department of Health Services or DHS), and the Regional Water Quality Control Board (RWQCB). The FFA established schedules for performing remedial investigations and feasibility studies and requires that remedial actions be completed as expeditiously as possible. In April 2000, an agreement was signed between the Army, EPA, and DTSC to evaluate military munitions and perform military munitions response activities at the former Fort Ord subject to the provisions of the Fort Ord FFA.

The basewide MR RI/FS program reviews and evaluates past investigative and removal actions, as well as recommends future response actions deemed necessary to protect human health and the environment regarding explosive safety risks posed by MEC on the basis of proposed reuses. These reuses are specified in the FORA Fort Ord Base Reuse Plan (*FORA, 1997*) and its updates. All basewide MR Remedial Investigation/Feasibility Study documents have been or will be prepared in cooperation with the EPA and DTSC in accordance with the FFA, made available for public review and comment, and placed in the Administrative Record. Primary documents under the FFA are subject to EPA approval (in consultation with DTSC).

The Army has been conducting military munitions response actions (e.g., investigation, removal) at identified MRSs and will continue these actions to mitigate imminent MEC-related hazards to the public, while gathering data about the type of military munitions and level of hazard at each of the MRSs for use in the basewide MR Remedial Investigation/Feasibility Study. The Army is performing its activities pursuant to the President's authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580 and in compliance with the process set out in CERCLA Section 120. Regulatory agencies (EPA and DTSC) have been and will continue to be involved and provide input regarding munitions response activities.

The Army conducts ongoing and future responses to MEC at the former Fort Ord that are components of the Army's basewide efforts to promote explosive safety because of Fort Ord's history as a military base. These efforts include: (1) five-year reviews and reporting; (2) deed or property transfer documentation or letter of transfer notices; (3) MEC incident reporting; (4) MEC recognition and safety training; (5) school education; and (6) community involvement.

The basewide MR Remedial Investigation/Feasibility Study program is organized as a "tracking" process whereby sites with similar characteristics will be grouped to expedite cleanup, reuse, and/or transfer based on current knowledge. A site or area is assigned to a specific "track" (i.e., Track 0, 1, 2, or 3) according to the level of military munitions usage, military munitions investigation, sampling, or removal conducted to date, as described in the OE Remedial Investigation/Feasibility Study Work Plan (*USACE, 2000*). Track 0 areas at the former Fort Ord contain no evidence of MEC and have never been suspected as having been used for military munitions-related activities of any kind. Track 1 sites were

suspected to have been used for military training with military munitions, but based on a remedial investigation, no further action is required. Track 2 sites are areas at the former Fort Ord where MEC items were present, and MEC removal has been conducted. Track 3 sites are those areas where: (1) MEC are suspected or known to exist, but investigations are not yet complete or need to be initiated; or (2) areas identified in the future that meet this definition. The Parker Flats MRA qualifies as a Track 2 site because MEC items were present, and MEC removal has been conducted.

## 2.4. Community Participation

The Final Parker Flats MRA Remedial Investigation/Feasibility Study Report was published on August 31, 2006, and the Proposed Plan for the Parker Flats MRA was made available to the public on February 9, 2007. The Proposed Plan presented the preferred alternative selected as the final remedy in this ROD, and summarized information in the Parker Flats MRA Remedial Investigation/Feasibility Study and other supporting documents in the Administrative Record. These documents were made available to the public at the following locations:

- Seaside Branch Library, 550 Harcourt Avenue, Seaside, California.
- California State University Monterey Bay (CSUMB) Library Learning Complex, 100 Campus Center, Building 12, Seaside, California.
- Fort Ord Administrative Record, Building 4463, Gigling Road, Room 101, Ord Military Community, California.
- [www.fortordcleanup.com](http://www.fortordcleanup.com) website.

The notice of the availability of the Proposed Plan was published in the *Monterey County Herald* and the *Salinas Californian* on February 15, 2007. A public comment period was held from February 15 to March 17, 2007. In addition, a public meeting was held on March 1, 2007 to present the Proposed Plan to a broader community audience than those that had already been involved at the site. At this meeting, representatives from the Army, EPA, and DTSC were present, and the public had the opportunity to submit written and oral comments about the Proposed Plan. The Army's response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

## 2.5. Scope and Role of Response Action

This ROD addresses the planned response action for managing the potential risk to future land users from MEC that potentially remains in the Parker Flats MRA, where the Army has completed a munitions response as described in the Parker Flats MRA Remedial Investigation/Feasibility Study (MACTEC, 2006).

The planned response action for this MRA will be the final remedy for protection of human health and the environment. Remedial Alternative 2, which was identified as the preferred remedial alternative for the Parker Flats MRA, is summarized as follows:

**Remedial Alternative 2—Land Use Controls (LUCs):** MEC recognition and safety training for workers that will conduct ground disturbing or intrusive activities, and construction monitoring during ground disturbing or intrusive activities; and restrictions against residential use.

An RD/RAWP will be developed to: (1) outline the processes for implementing land use restrictions; and (2) identify procedures for responding to discoveries of MEC, including coordinating a response to a

discovery of a significant amount of MEC in the Parker Flats MRA. The selected LUCs may be modified in the future based on the five-year review process.

In addition, Long Term Management Measures comprised of a deed restriction, CRUPs, annual monitoring and reporting, and five-year review reporting will be implemented for all reuse areas within the Parker Flats MRA.

Munitions constituents associated with small arms and UXO were addressed as part of the Hazardous and Toxic Waste (HTW) Remedial Investigation/Feasibility Study program. No restrictions related to munitions constituents in soil were recommended following completion of a literature review, site reconnaissance, and soil sampling (*Shaw/MACTEC, 2006*).

## **2.6. Site Characteristics**

The Parker Flats MRA is approximately 758 acres in size and located in the central part of the former Fort Ord between the former Fort Ord Main Garrison and the former impact area (Plate 1). The portion of the Parker Flats MRA, which lies south of Gigling Road, was purchased by the government in 1917. The portion to the north of Gigling Road was privately held agricultural land until the 1940s. The site is primarily undeveloped.

The Parker Flats MRA is composed of portions or all of 13 MRSs (i.e., MRS-3, MRS-4B, MRS-13B, MRS-27A, MRS-27B, MRS-27G, MRS-37, MRS-40, MRS-50, MRS-52, MRS-53, MRS-54EDC, and MRS-55) shown on Plate 2, many of which were used for live-fire training (e.g., artillery, mortar) and other military training that may have included the use of military munitions. The northern portion of the Parker Flats MRA, which is comprised entirely of MRS-13B (Practice Mortar Range), and is separated from the southern portion of the Parker Flats MRA by an area at which an investigation for the presence of MEC has not been completed. The southern portion of the Parker Flats MRA includes the remaining MRSs.

## **2.7. Parker Flats MRA Track 2 Remedial Investigation Summary**

The Parker Flats MRA was evaluated as a Track 2 site, and contains portions or all of 13 MRSs identified on Table 1 where MEC removals have been conducted. These MRSs are also shown on Plate 2. The Remedial Investigation for the Parker Flats MRA is based on the evaluation of previous work conducted for the site according to the guidance provided in the *Final Plan for the Evaluation of Previous Work* (HLA, 2000b) and the *Track 2 Data Quality Objectives Technical Memorandum* (DQO Tech Memo) (*MACTEC, 2003*).

The results of the evaluation performed for the Parker Flats MRA indicated there was a strong weight of evidence to support the conclusion that the data are useable for performing a Risk Assessment and Feasibility Study as determined by the Project Team. The Project Team was composed of representatives from the Army, EPA, and DTSC.

This section provides background information on the Parker Flats MRA Remedial Investigation data collection and review (site evaluations) conducted for the MRSs. Table 1 summarizes the results of the site-specific remedial investigations, and Section 2.8. presents a summary of the site evaluations for the MRSs presented in the Parker Flats MRA Remedial Investigation/Feasibility Study (Volume I; *MACTEC, 2006*).

**Scope of Removal Actions** — The munitions response actions were designed to address MEC to depths of four feet below ground surface (bgs); however, all anomalies (i.e., ferromagnetic material), even those

deeper than four feet bgs, were investigated with all detected MEC encountered removed within the Parker Flats MRA. All further statements in this document referring to "removals to four feet bgs" should be understood to include the prosecution of all detected anomalies to resolution, regardless of their depth bgs. The munitions response actions conducted within the Parker Flats MRA focused on addressing explosive safety. According to the U.S. Army Corps of Engineers (USACE) UXO Safety Specialist for the Sacramento District, when non-military munitions related debris was found, it was removed from the excavation and inspected for explosive hazards and for the presence of hazardous wastes. If MEC or hazardous wastes were identified, it was removed and disposed of following the appropriate requirements. After inspection, non-hazardous debris was either left at or removed from the site.

At the Parker Flats MRA three primary munitions response contractors performed munitions responses to MEC: (1) Human Factors Applications, Inc. (HFA); (2) CMS Environmental, Inc. (CMS), now known as USA Environmental, Inc. (USA); and (3) Parsons (Parsons' work was limited to a data validation effort performed in 2005).

**Site Evaluations**—The available data (e.g., archival and removal data) regarding the Parker Flats MRA were reviewed and evaluated according to procedures described in the *Final Plan for Evaluation of Previous Work* (HLA, 2000b). The evaluation process was documented by completion of a series of checklists. Checklists prepared for the southern part of the Parker Flats MRA and for the northern part of the Parker Flats MRA (MRS-13B) were provided as Appendix A of the Parker Flats MRA Remedial Investigation (Volume I; *MACTEC*, 2006).

As described in the Parker Flats MRA Remedial Investigation (Volume I; *MACTEC*, 2006), the MRSs that comprise the MRA were first identified in Archives Searches conducted in 1993, 1994, and 1997. These searches included reviews of historical maps and other documents, as well as interviews with current and former Fort Ord personnel (ASR; *USAEDH*, 1997).

The Army's munitions response contractors completed a MEC removal to four feet bgs within the Parker Flats MRA. The surveys were conducted using Schonstedt GA-52Cx hand held magnetometers. Subsurface MEC removal was completed in all areas within the Parker Flats MRA except where the ground surface was obstructed by pavement or other structures, which provide a protective barrier against any explosive hazard that may be present. Following the removal action, quality control surveys were completed over 10 percent of each grid to evaluate the quality of the removal action. If additional anomalies were discovered during the quality control survey, they were investigated and removed as appropriate. Of the 5,164 grids surveyed, only 15 grid failures occurred. These grids were reinvestigated for subsurface MEC. Following the quality control survey, a quality assurance survey was conducted over an additional 10 percent of the site. No quality assurance failures occurred during the Parker Flats removal action.

## **2.8. Parker Flats MRA Munitions Response Site Summaries**

This section summarizes the removal actions conducted for the MRSs identified in the Parker Flats MRA Remedial Investigation (Volume I; *MACTEC*, 2006). MEC encountered during these actions were destroyed by detonation and recovered munitions debris (MD) was disposed or recycled after being inspected and determined not to pose an explosive hazard. Table 1 summarizes key information about each MRS. It should be noted that the Parker Flats MRA contains only portions of some of the 13 MRSs where MEC removal was conducted, as shown on Plate 2. Results of removal actions within portions of MRSs reference data presented for the adjacent sites, as appropriate.

**MRS-3**

Based on the MRS-3 sampling results, a MEC removal to four feet bgs was recommended per the Final Phase I Engineering Evaluation/Cost Analysis (Phase I EE/CA). In March of 1998, USA conducted a MEC removal to four feet bgs using the Schonstedt Model GA-52/Cx magnetometer at MRS-3, with all detected anomalies investigated. During this munitions response, 58 100- X 100-foot grids and partial grids were investigated. 167 MEC items were removed. In addition, 312 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Items removed included numerous practice mortars (MD), and signals, simulators, and practice mines (MEC and MD). The military munitions found at MRS-3 were consistent with the reported historical use of the MRS for practice mortar training, demolition training, landmine warfare, and anti-armor training.

**MRS-4B**

To determine whether a removal action was required at MRS-4B, USA performed a subsurface sampling investigation (SiteStats/GridStats sampling; SS/GS). In December of 1997, 5 100- X 200-foot grids were surveyed using a Schonstedt GA-52/Cx magnetometer with a maximum search lane width of 5 feet. Following the survey, anomalies were selected for sampling following the SS/GS procedures. During this investigation, three smoke grenades that were considered to be MEC were recovered. In addition, several other items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Based on the investigation's results, a decision was made to conduct a MEC removal to four feet bgs. The MRS was subsequently subdivided into 48 100- X 100-foot removal grids. A MEC investigation using the Schonstedt Model GA-52/Cx magnetometer was conducted with all MEC detected removed. During this munitions response, 211 MEC items were removed. In addition, 293 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Most of the items found at MRS-4B were consistent with the reported historical use of the MRS for Chemical, Biological, and Radiological (CBR) training with grenades containing irritant smoke, and general military training with simulators, illumination and smoke signals, blasting caps, and fuzes.

**MRS-13B**

Based on the HFA 1994 MRS-13B investigation results, a MEC removal to four feet bgs was recommended per the Final Phase I EE/CA. From August 1995 to April of 1998, USA conducted an investigation for MEC using the Schonstedt Model GA-52/Cx magnetometer. Portions of MRS-13B were either not geophysically investigated or only underwent a surface geophysical investigation. Pavement and structures associated with the Army Maintenance Center that is located within the parcel precluded evaluation of 35.5 acres of MRS-13B. Additionally, only a surface removal was conducted at a small portion (approximately 1 acre) of the Army Maintenance Center because of the proximity of metal fencing and underground utilities. Approximately 7 grids within the Park and Ride were also not geophysically investigated because of the presence of asphalt pavement. A removal action was performed over 654 100- X 100-foot grids and partial grids. During this munitions response, 267 MEC items were removed. In addition, 1,310 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. A significant number of the MD items were expended 3.5-inch practice rockets that were found in burial pits. The MEC items removed included rockets, pyrotechnics (simulators, flares and signals), smoke grenades, fuzes, and projectiles of various sizes. Numerous burial pits that contained both DMM and MD were discovered at MRS-13B at depths ranging from a few to 48 inches bgs. The DMM and MD recovered from burial pits included grenade and mine fuzes, firing devices, pyrotechnics (signal, illumination and smoke), rockets,

rifle and hand smoke grenades, blasting caps, simulators, and rifle grenades. On the basis of the results of the removal, no further action was recommended.

During this removal action, two partial Chemical Agent Identification Sets (CAIS) were also found. The 2 cardboard tubes recovered, each containing 12 intact glass vials, were discovered adjacent to metal canisters buried at depths of 1 and 1.5 feet. The Army's Technical Escort Unit from Dugway Proving Ground, Utah, recovered these CAIS. Based on the initial chemical analysis, 12 vials were disposed through the Fort Ord Defense Reutilization and Marketing Office (DRMO), with the remaining vials transferred to Aberdeen Proving Grounds, Maryland for further analysis.

### **MRS-27A, B, and G**

MRS-27A, MRS-27B, and MRS-27G are part of a group of 25 training sites identified on a 1984 training map that were used for overnight bivouac (camping). Based on historical evidence of munitions used in such areas, it was believed that blank cartridges, simulators, pyrotechnics, and smoke producing munitions could be found in these areas.

The boundaries of MRS-55 overlap with the boundaries of MRS-27A and MRS-27B; therefore, the MEC removal to four feet bgs that was conducted at MRS-55 also covered a portion of MRS-27A and MRS-27B. Review of the MRS-55 data indicated that two practice rifle grenades, hand grenade fuzes, and practice hand grenades, flares, signals, and a pyrotechnic mixture were identified within the MRS-27B or 27A boundaries. Items found within MRS-27A and MRS-27B were generally of the types associated with overnight bivouac training sites and general maneuver areas.

The expansion of the investigation and MEC removal to four feet bgs at MRS-53 south to Eucalyptus Road included a portion of MRS-27G. The items found within MRS-27G were generally of the types associated with overnight bivouac training sites and general maneuver areas. Within MRS-27G's boundaries a small number of 75 millimeter (mm) and 37mm items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. These munitions were most likely associated with training that occurred prior to establishing the area as a bivouac training site.

### **MRS-37**

Based on the results of a site walk conducted by a USACE UXO Safety Specialist of adjacent MRS-55, additional characterization was conducted at MRS-37. SS/GS sampling was completed to determine the extent to which military munitions were present.

In March 1998, 10 100- X 200-foot grids at MRS-37 were surveyed using a Schonstedt GA-52/Cx magnetometer with a maximum search lane width of 5 feet. Following the survey, anomalies were selected for investigation following SS/GS procedures. GridStats sampling operations in MRS-37 involved investigation of 1,833 anomalies within the 10 grids. Although MEC was not recovered, 29 pounds of debris was removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled.

In June 1998, to determine whether MEC removal was required, 100 percent grid sampling was performed around the GridStats grids with significant amounts of MD. During this investigation, 18 100- X 100-foot grids were surveyed using Schonstedt Model GA-52/Cx magnetometers. All detected anomalies were investigated. The 18 grids included 2 blocks of 9 grids measuring 300- X 300 feet. During this investigation, 2 MEC items (i.e., an illumination signal and 37mm projectile) were removed. In addition, 84 pounds of debris was removed, inspected and determined not to pose an explosive hazard;

these items were classified as MD and were disposed or recycled. Based on the sampling results a decision was made to conduct a MEC removal to four feet bgs. This MRS was subsequently subdivided into 240 100- X 100-foot removal grids. An investigation for MEC was conducted using the Schonstedt Model GA-52/Cx magnetometer, with all detected MEC removed. 50 MEC items were removed. In addition, over 1,100 other items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Several 37mm projectiles (MEC) and 37mm fragments were also removed, suggesting that the area was used for 37mm training prior to the 1940s. Simulators, practice hand grenades, blasting caps, and a smoke pot were also removed, suggesting that the area was also used for maneuvers and general training after the 1940s.

### **MRS-40**

To determine whether a removal action was required at MRS-40, USA completed a subsurface investigation following SS/GS procedures. In October 1997, the boundary of MRS-40 was surveyed and 2 100- X 200-foot grids were surveyed using a Schonstedt Model GA-52/Cx magnetometer with a maximum search lane width of 5 feet. MRS-40 consists of approximately 1.7 acres and the 2 grids covered over half of the MRS. Consistent with SS/GS procedures, 151 anomalies were investigated. Although MEC was not found, 3 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Nothing was found during the investigation to indicate that MRS-40 was used as a CBR training area. All of MRS-40 was later incorporated into the removal action conducted at MRS-50. All grids within MRS-40 underwent a MEC removal to four feet bgs. The removal action results are included in the MRS-50 discussion below.

### **MRS-50**

In 1998, USA completed a subsurface investigation of MRS-50 using a Schonstedt Model GA-52/Cx magnetometer, of 22 100- X 100-foot grids during which all detected anomalies were investigated and a MEC removal to 4 feet bgs was conducted. During this response, 26 MEC items were removed. In addition, 149 pounds of debris was removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Of the 26 MEC items recovered, 2 munitions (a MK I 75mm Shrapnel projectile, which was found at a depth of 1 foot, and a 3-inch Stokes practice mortar, which was found at a depth of 1.5 feet) were penetrating projectiles. Based on the results of this investigation, a MEC removal to four feet bgs was performed by USA at MRS-50 starting in September 1998 and continuing through December 2000. Removal operations were conducted on the remaining 166 100- X 100-foot grids and 61 partial grids within MRS-50. As the removal grids within the boundary of MRS-50 were completed, USACE and USA developed a protocol to be used to expand the investigation of additional areas beyond the boundaries of an MRS. The protocol specified conducting additional investigation and removal 200 feet beyond the location of any projected military munitions, and 100 feet beyond the location of all thrown or placed military munitions. The protocol also considered significant discovery of MD as a reason for additional investigation and removal of the surrounding area. Application of the expansion protocol added approximately 85 acres to the investigation conducted at MRS-50 (MRS-50 expansion).

The expansion of MRS-50's investigation extended west to Parker Flats Cut Off Road, east to the boundary of MRS-53, south to Eucalyptus Road (including MRS-40), and to the north to an arbitrary line established by the USACE. The MRS-50 expansion included MEC removal to four feet bgs (all anomalies detected were investigated) within a few grids on the west side of Parker Flats Cut Off Road (outside of the MRA, within and adjacent to MRS-44). However, a decision was made to not continue MRS-50's investigation beyond the MRA under the current removal contract. During this response, 936 MEC items were removed. The majority of these items were non-penetrating (e.g., pyrotechnics, grenades, and grenade and projectile fuzes) munitions. The penetrating military munitions found

included projectiles, rifle grenades, and rockets. Both DMM and MD were found in numerous burial pits that were discovered at depths ranging from a few to 48 inches bgs. The After Action Report (AAR) indicated that it is possible, but not probable, that DMM that was buried beyond the detection capabilities of the Schonstedt Model GA-52/Cx remains buried within MRS-50 and the MRS-50 expansion areas. The AAR also stated that there was a strong indication that penetrating military munitions could be beneath the surface of Parker Flats Cut-Off and Eucalyptus Road.

## **MRS-52**

MRS-52 (Rifle Grenade and Projectile Target Area) was identified during interviews conducted during the Preliminary Assessment/Site Inspection (PA/SI) phase of the Fort Ord Archives Search. The location was reportedly used as a rifle grenade (unknown type) and shoulder-launched projectile target area (unknown type). A site walk was conducted in 1996 by the USACE UXO Safety Specialist, which involved walking portions of the sites and sweeping the path walked using a Schonstedt Model GA-52/Cx magnetometer. During the walk in the central and northern portion of MRS-52, no evidence of MEC was observed, only expended blank small arms ammunition was found. During the walk of the southern portion of MRS-52, fragmentation consistent with 37mm projectiles and three M10 practice antitank (AT) mines were found. On the basis of the site walk, the Revised ASR recommended further investigation in the vicinity of the AT mines.

As described below, an expansion of the MRS-53 removal action covered the previously identified MRS-52 site boundaries. A description of the items found during the MRS-53 removal action including the expansion area is provided below.

## **MRS-53**

In June 1998, USA performed a subsurface investigation of MRS-53 for MEC. During this action USA investigated all detected anomalies at 52 100- X 100-foot grids using a Schonstedt Model GA-52/Cx magnetometer. During this investigation, 19 MEC items were removed. In addition, 453 pounds of debris was removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. 10 of the MEC items were determined to be practice mortars, and the remainder were non-penetrating pyrotechnics and explosives.

Based on the investigation's results, USA conducted a MEC removal to four feet bgs at MRS-53 beginning in September 1998 and continuing through December 2000. USA also conducted removal operations on 1,305 full and partial grids within MRS-53 where investigation had not been conducted. As the removal grids within the boundary of MRS-53 were completed, USACE and USA developed a protocol to be used to expand the investigation of additional areas beyond the boundaries of an MRS. The protocol specified conducting additional investigation and removal 200 feet beyond the location of any projected military munitions, and 100 feet beyond the location of all thrown or placed military munitions. The protocol also considered significant discovery of MD as a reason for additional investigation and removal of the surrounding area.

Application of the expansion protocol added approximately 192 acres to the investigation conducted at MRS-53 (MRS-53 expansion). The expansion of the investigation of MRS-53 extended west to the MRS-50 removal boundary, east to the western boundaries of MRS-3, MRS-37 and MRS-55 (including MRS-52), southeast to the BLM property boundary, south to Eucalyptus Road (including MRS-27G), and to the north to an arbitrary line established by the USACE. During this removal, 1,291 MEC items were found and removed. The MEC found included non-penetrating items (e.g., pyrotechnics, grenades, and grenade and projectile fuzes) and projectiles the majority of which were 3-inch Stokes practice mortars. Numerous burial pits were discovered during the removal conducted at MRS-53. Both DMM and MD



were found in burial pits at depths ranging from a few to 48 inches bgs. The DMM and MD recovered from these pits included fuzes (grenade, mine, time, and projectile), signals, practice mines (antitank and antipersonnel), projectile simulators, hand and rifle grenades (practice and smoke), and practice rockets. The AAR indicated that it is possible, but not probable, that DMM that was buried beyond the detection capabilities of the Schonstedt Model GA-52/Cx remains buried within MRS-53 and the MRS-53 expansion areas. The AAR also stated that there is a strong indication that penetrating military munitions could be beneath the surface of Parker Flats Road and Eucalyptus Road.

### **MRS-54EDC**

In March 1999, USA investigated all detected anomalies at 7 100- X 100-foot grids at MRS-54EDC using a Schonstedt Model GA-52/Cx magnetometer. During this investigation, 4 non-penetrating military munitions items were removed. In addition, 16 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. The non-penetrating MEC items were found at depths ranging from 6 to 36 inches bgs. On the basis of the investigation's results, a MEC removal to four feet bgs was conducted at MRS-54EDC beginning in June 1999. MRS-54EDC was surveyed using a Schonstedt Model GA-52/Cx magnetometer. The site was divided into 83 100- X 100-foot grids and partial grids. During the investigation, all detected anomalies were investigated and 14 non-penetrating MEC items (flares, ground illumination signals, simulators, smoke grenades, and blasting caps) were removed. In addition, numerous MD items were also removed.

### **MRS-55**

Based on the results of a site walk conducted by a USACE UXO Safety Specialist of MRS-55, additional characterization was conducted at the site. SS/GS sampling was completed to determine the extent of any MEC present. In March 1998, 23 100- X 200-foot grids were identified at MRS-55. Subsequently, 19 of these grids were surveyed using a Schonstedt Model GA-52/Cx magnetometer with a maximum search lane width of 5 feet. Following the survey, anomalies were selected for investigation following the SS/GS procedures. During the investigation, 6 MEC items (4 practice grenade fuzes, an illumination signal and a rifle-fired smoke grenade) were removed. In addition, 11 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Based on the results of the SS/GS sampling, a decision was made to conduct a MEC removal to four feet bgs.

Starting in March 1999, USA investigated all detected anomalies during a MEC removal to four feet bgs on 282 100- X 100-foot grids and partial grids. The removal effort stopped at the boundary of MRS-55. 144 MEC items were removed. In addition, 1,779 items were removed, inspected and determined not to pose an explosive hazard; these items were classified as MD and were disposed or recycled. Of the 144 MEC items recovered, only 5 were penetrating military munitions (40mm and 37mm projectiles). The remainder of the MEC recovered were fuzes, signals (flares and illumination), simulators, hand grenades (smoke, riot, and practice), and pyrotechnic mixtures. Numerous burial pits were discovered during the removal conducted at MRS-55. Both DMM and MD were found in burial pits at depths ranging from a few to 36 inches bgs. The DMM and MD recovered from these pits included grenade fuzes, signals, projectile simulators, smoke pots, and rifle grenades (practice). The AAR indicated that it is possible, but not probable, that DMM that was buried beyond the detection capabilities of the Schonstedt Model GA-52/Cx remains buried within MRS-55.

## **2.9. Current and Potential Future Land and Resource Uses**

The future land uses are primarily based upon the FORA March 1997 Fort Ord Base Reuse Plan (FORA, 1997) and the July 1995 USACE and BLM Site Use Management Plan (SUMP) (USACE, 1995).

Other sources of future land use information include public benefit conveyance, negotiated sale requests, transfer documents, and the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (USACE, 1997). The Reuse Plan identified approximately 20 land-use categories for the former Fort Ord (FORA, 1997). These include habitat management, open space/recreation, institutional/public facilities, commercial, industrial/business park, residential, tourism, mixed use, and others. Preliminary plans have been developed for parcels within the Parker Flats MRA; however, planning continues and future uses may be modified.

Under the Base Reuse Plan, currently anticipated future use of the property in the southern portion of the Parker Flats MRA includes the establishment of a veterans' cemetery, an emergency vehicle operations center (EVOC) for Monterey Peninsula College, and habitat reserve areas. In the northern and southern portions of the Parker Flats MRA, two areas are designated for "development reserve" that could include residential development. The proposed use of the rest of the northern portion of the Parker Flats MRA includes development of a maintenance center for Monterey Salinas Transit (MST), an Army maintenance center, a park and ride, and public facilities for Monterey County. Additionally, a small part will be used for the CSUMB Expansion Area. Portions of the Parker Flats MRA also include plans for a horse park. These reuse areas are identified in Table 2 and shown on Plate 2.

Within the Parker Flats MRA, there are two areas (i.e., the CSUMB Expansion parcel and the MRS-13B Habitat Reserve parcel) (approximately 2 acres) that are not included in this ROD. These areas will be addressed in a separate decision document that addresses adjacent parcels. Therefore, of the 758 acres comprising the Parker Flats MRA that was evaluated in the Remedial Investigation/Feasibility Study (Section 2.7.), the reuse areas included in this ROD total approximately 756 acres. All of the proposed reuse scenarios could result in ground disturbing activities (e.g., during construction/excavation).

## 2.10. Summary of Site Risks

A munitions response has been completed at the Parker Flats MRA, significantly reducing the potential risks to human health and the environment. Because detection technologies may not detect all MEC present and some areas contain barriers (e.g., pavement, buildings) that, while providing protection against any MEC potentially present, preclude the use of detection technologies, a future land user may encounter MEC. This risk was evaluated in a risk assessment as part of the Remedial Investigation/Feasibility Study.

The MRSs that are identified in Section 2.8 and summarized in Table 1 were combined into the land use areas that are summarized in Table 2 for the risk assessment conducted in the Parker Flats MRA Risk Assessment (Volume II; *Malcolm-Pirnie*, 2005). Plate 2 shows both the MRSs and land use areas identified for evaluation in the Risk Assessment and Feasibility Study.

For the basewide MR Remedial Investigation/Feasibility Study being conducted at the former Fort Ord, the Project Team (the Army, EPA, and DTSC) developed the Fort Ord Ordnance and Explosives (OE) Risk Assessment Protocol (*Malcolm Pirnie*, 2002) to qualitatively estimate the potential explosive safety risks posed by MEC at MRSs on the former Fort Ord. Because MEC removals had been completed, the Project Team evaluated "Baseline" (prior to MEC removal) and "After-Action" (after MEC removal) land use conditions. The Project Team developed "Overall MEC Risk Scores" for each area for the baseline scenarios, after-action use scenarios, and multiple anticipated "receptors" that the team assumed would use these areas. The MEC risk assessment did not establish acceptable remediation levels, but was used to develop and evaluate remedial alternatives during the Feasibility Study.

The MEC Risk Assessment Protocol results are based on three key factors (MEC Hazard Type, Accessibility, Exposure) that were assigned use-specific values and are weighted in importance. These factors were used to develop an Overall MEC Risk Score for each potential receptor at a given reuse area as follows:

Overall MEC Risk Score	A	B	C	D	E
	Lowest	Low	Medium	High	Highest

Exposure assumptions used in the development of Overall MEC Risk Scores in the Parker Flats MRA Risk Assessment (Volume II; *Malcolm-Pirnie, 2005*) included the following:

- During Development: Workers (e.g., construction, outdoor maintenance, habitat, cemetery) performing ground disturbing or intrusive activities were the only likely receptors identified during development of these areas.
- During Reuse: The likely receptors for future use of the areas include:
  - Non-Residents—Indoor workers, facility visitors, trespassers, recreational users, habitat monitors, and student/faculty.
  - Adult/Child Residents
  - Workers Conducting Ground Disturbing or Intrusive Activities—Construction workers, outdoor maintenance workers, habitat workers, and cemetery workers.

In general, the results of the risk assessment for the Parker Flats MRA indicated that the completed MEC investigation and removal actions decreased the overall risks for the majority of the use-specific receptors evaluated. For the majority of the potential receptors evaluated (e.g., trespassers, recreational users, indoor workers, public facility visitors), the Overall MEC Risk Scores were estimated as low (B) or the lowest (A). For these potential receptors, additional risk management was not determined to be necessary. For the remaining receptors (e.g., construction workers, outdoor maintenance workers, habitat workers) who conduct ground disturbing or intrusive activities, Overall MEC Risk Scores were estimated as high (D) or the highest (E). For these potential receptors, additional risk management was determined to be necessary.

The qualitative Overall MEC Risk Scores were used in the Parker Flats MRA Feasibility Study (Volume III; *MACTEC, 2006*) to guide the development and evaluation of response alternatives for the Parker Flats MRA during development and for reasonably anticipated future uses.

The response action selected in this Record of Decision is necessary to protect the public health or welfare from the possible presence of subsurface MEC.

## 2.11. Remedial Action Objectives

The primary remedial action objectives (RAOs) for the Parker Flats MRA, based on EPA's Remedial Investigation/Feasibility Study Guidance (*EPA, 1989*), are to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs". As described in EPA's *Land Use in the CERCLA Remedy Selection Process* (*EPA, 1995*), "Remedial action

objectives provide the foundation upon which remedial cleanup alternatives are developed. In general, remedial action objectives should be developed in order to develop alternatives that would achieve cleanup levels associated with the reasonably anticipated future land use over as much of the site as possible. EPA's remedy selection expectations described in section 300.430 (a) (1) (iii) of the NCP should also be considered when developing remedial action objectives. Where practicable, EPA expects to treat principal threats, to use engineering controls such as containment for low-level threats, to use institutional controls to supplement engineering controls...."

Consistent with EPA's guidance, (1) the principal threats at the Parker Flats MRA reuse areas have already been treated (i.e., MEC removal actions have been completed), and (2) institutional controls (herein referred to as land use controls or LUCs) were considered in the development of response alternatives for managing the risk from MEC that potentially remains at the MRA.

Although the Army determined that there were no potential Federal or State ARARs that relate to LUCs at the Parker Flats MRA, LUCs will be implemented in a manner consistent with Federal and State guidance. While the Army does not consider California laws and regulations concerning Land Use Covenants to be potential ARARs, after the Parker Flats MRA ROD is signed, the Army will enter into State Land Use Covenants that document the land use restrictions selected as part of the remedy. Although the DTSC and EPA Region IX disagree with the Army's determination that California laws and regulations concerning Land Use Covenants are not potential ARARs, they will agree-to-disagree on this issue if the Army signs State Land Use Covenants acceptable to the DTSC. State Land Use Covenants signed by the Army and the State of California in the past restricting the reuse of the property were acceptable to the DTSC.

## 2.12. Description of Alternatives

Remedial alternatives for the eight Parker Flats MRA reuse areas were evaluated in the Parker Flats MRA Feasibility Study (Volume III; *MACTEC*, 2006), and are summarized in the Proposed Plan (*Army*, 2007a).

Within the Parker Flats MRA, there are two areas (i.e., the CSUMB Expansion parcel and the MRS-13B Habitat Reserve parcel) (approximately 2 acres) that are not included in this ROD. These areas will be addressed in a separate decision document that addresses adjacent parcels. Therefore, of the 758 acres comprising the Parker Flats MRA that was evaluated in the Remedial Investigation/Feasibility Study (Section 2.7.), the reuse areas included in this ROD total approximately 756 acres. All of the proposed reuse scenarios could result in ground disturbing or intrusive activities (e.g., during construction/excavation).

Long Term Management Measures that will be implemented as part of the LUC implementation strategy at the Parker Flats MRA include a deed restriction, CRUPs, annual monitoring, and five-year review reporting. These measures, which are considered part of the implementation and management aspects of the remedial alternatives, rather than specific mitigation measures, are described further in Section 2.14.2. The costs associated with implementing these measures for the entire Parker Flats MRA over a period of 30 years are approximately \$258,000.

The Parker Flats MRA Risk Assessment (Volume II; *Malcolm-Pirnie*, 2005) identified certain receptors (i.e., workers conducting ground disturbing or intrusive activities) as requiring additional risk management. The three remedial alternatives that were developed to mitigate the risk to these receptors from any MEC that potentially remains at the Parker Flats MRA are:

- **Remedial Alternative 1: No Further Action**—Assumes no further action would be taken related to MEC. Included as required under CERCLA and the NCP, as a baseline for comparison to the other remedial alternatives.
- **Remedial Alternative 2: Land Use Controls (LUCs)**—Includes: (1) MEC recognition and safety training for workers that will conduct ground disturbing or intrusive activities, and (2) construction monitoring during ground disturbing or intrusive activities to address any MEC that remains in the subsurface. Based on comments from the regulatory agencies subsequent to the final Remedial Investigation/Feasibility Study, this alternative includes restrictions against residential use. Specific methods and procedures for reasonably anticipated land uses would be described in further detail in a RD/RAWP.
- **Remedial Alternative 3: Additional MEC Remediation**—Includes: (1) vegetation clearance, if necessary, and (2) additional investigation and removal to address the possibility that MEC remains in the subsurface. Specific methods and procedures for MEC investigation and removal would be described in further detail in a RD/RAWP.

Remedial Alternatives 2 and 3 are described in further detail below:

#### **Remedial Alternative 2: Land Use Controls (LUCs)**

The costs associated with implementing LUCs (MEC recognition and safety training, construction monitoring, and restrictions against residential use) under this alternative over a period of 30 years are estimated to be a total of \$995,000 for the eight land use areas within the Parker Flats MRA.

#### ***MEC Recognition and Safety Training***

For the eight land use areas within the Parker Flats MRA addressed by this ROD, ground disturbing or intrusive activities are expected to occur. People conducting such activities will be required to attend the "MEC recognition and safety training" to increase their awareness of and ability to recognize MEC. Prior to conducting any planned ground disturbing or intrusive activities, the landowner will be required to notify the Army or Army's representatives to arrange for MEC recognition and safety training. This training will be provided to all workers that are to perform ground disturbing or intrusive activities.

As part of the five-year review, the Army or its representatives would assess whether the training program should continue. If experience indicates that MEC has not been encountered during ground disturbing or intrusive activities within the area, the program may, with regulatory approval, be discontinued. However, it may be subject to reinstatement should MEC be encountered in the future.

#### ***Construction Monitoring***

Construction monitoring would be provided by UXO-qualified personnel during any ground disturbing or intrusive activities at the Parker Flats MRA to address potential explosive safety risks posed by MEC to construction personnel. Construction monitoring would be arranged, during the planning stages of a construction project, prior to the start of any ground disturbing or intrusive activities. UXO-qualified personnel would monitor ground disturbing and intrusive construction activities for the potential presence of MEC. During ground disturbing activities, if MEC is encountered, ground disturbing activities in the area and adjacent areas would cease and the encounter would be reported to local law enforcement. The local law enforcement agency would promptly request Department of Defense (DoD) support for response (e.g., an Explosive Ordnance Disposal [EOD] unit). After the response, the Army would reassess the probability of encountering MEC. If the probability of encountering MEC remains low, construction could resume with construction monitoring. If the

probability is determined to be moderate or high, then MEC removal would be conducted in the construction footprint before construction could resume.

Construction monitoring may be applicable in the short-term during development or in the long-term after established use. The Army would notify the regulatory agencies, as soon as practicable, of any MEC-related data identified during use of the property, and report the results of monitoring activities annually. The Army would also conduct five-year reviews.

As part of annual monitoring and five-year review reporting, the Project Team (the Army, EPA, and DTSC) would review MEC-related data collected during the property's development to determine whether construction monitoring should continue. If experience indicates that MEC has not been encountered during development or use of an area, construction monitoring may, with regulatory approval, be discontinued. However, it may be subject to reinstatement should MEC be encountered in the future.

### ***Restrictions Against Residential Use***

The preferred remedial alternative of LUCs described in the Final Parker Flats MRA Feasibility Study (Volume III; *MACTEC*, 2006) did not include restrictions against residential use. However, in its October 18, 2006 letter, DTSC stated "...it would be appropriate to establish land use restrictions to assure the property will not be used for residential or other sensitive uses without further investigation" in addition to the other two elements of the LUC alternative (*DTSC*, 2006b). In a letter dated October 16, 2006, EPA requested that the Army include a residential restriction in the preferred remedial alternative to ensure that, prior to residential use, the area is "reviewed again" (*EPA*, 2006). Based on the Remedial Investigation/Feasibility Study, the Army's position is that the additional layer of protection provided by a residential use restriction is not necessary for the Parker Flats MRA; however, in consideration of regulatory input, the preferred remedial alternative includes a LUC prohibiting residential use. For the purpose of this ROD, residential use includes, but is not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (*Army*, 2007b). Any proposal for residential development in the Parker Flats MRA will be subject to regulatory review. It should be noted that, per the Fort Ord Base Reuse Plan, only the "development reserve" could include residential development as a potential future use (*FORA*, 1997).

### **Remedial Alternative 3: Additional MEC Remediation**

The cost associated with implementing Additional MEC Remediation (vegetation clearance if necessary, and additional investigation and removal) under this alternative over a period of 30 years is estimated to be a total of \$18.13 million for the eight land use areas within the Parker Flats MRA. Costs for this alternative may be higher than estimated because: (1) after additional MEC remediation is completed, these areas would require re-evaluation of potential risk from MEC; and (2) the areas are likely to continue to require additional risk mitigation measures (e.g., LUCs) to protect human health during development and long-term reuse.

### ***Vegetation Clearance***

Much of the site is vegetated. Depending on the type and height of vegetation present and the reasonably anticipated use of the area (or portion thereof) requiring additional MEC remediation, some form of vegetation clearance may be required. The range of vegetation clearance methods that are potentially applicable at the former Fort Ord were described and evaluated in the *Draft Final Technical Memorandum, Evaluation of Vegetation Clearance Methods, Ordnance and Explosives Remedial*

*Investigation/Feasibility Study, Former Fort Ord, California* (Vegetation Clearance Technical Memorandum; *Harding ESE, 2002*). Table 12 of the Vegetation Clearance Technical Memorandum presents a matrix of vegetation clearance methods that should be retained for further consideration for the range of different plant communities (or types of vegetation) found at the former Fort Ord.

The selection of vegetation clearance methods depends on: (1) the type of vegetation present, and (2) the reasonably anticipated use of the site. For the three types of vegetation present at the Parker Flats MRA (oak woodlands, central maritime chaparral, and grasslands), vegetation clearance methods that may apply include manual cutting, mechanical cutting, and prescribed burning.

### **MEC Remediation**

After vegetation clearance is performed, if necessary, a digital geophysical survey of the area to be remediated would be performed using the best available and appropriate technology. Any anomalies identified would be reacquired and, when appropriate, investigated, with any MEC found removed. While MEC remediation activities involving ground disturbing or intrusive activities in areas known or suspected to contain MEC are performed per a Department of Defense Explosives Safety Board (DDESB)-approved explosives safety submission, all recovered MEC would be detonated using approved EOD procedures.

Digital geophysical detection equipment and associated Standard Operating Procedures (SOPs) would be identified in the site-specific work plan based on site conditions and per USACE Data Item Descriptions (DIDs) and site-specific Quality Control (QC) criteria, which may be considered data quality objectives (DQOs).

## **2.13. Principal Threat Wastes**

A munitions response has been completed at the Parker Flats MRA. The principal threats at the Parker Flats MRA reuse areas have already been treated (i.e., MEC removal actions have been completed), significantly reducing the risks to human health and the environment. The selected remedy includes LUCs because detection technologies may not detect all MEC present and some areas contain barriers (e.g., pavement, buildings) that while providing protection against any MEC potentially present, preclude the use of detection technologies. The source material constituting the principal threats at the Parker Flats MRA are MEC that potentially remains below the ground surface (in the subsurface).

The remedial alternative will address the threat through implementing:

- Land Use Controls (LUCs): MEC recognition and safety training for workers that conduct ground disturbing or intrusive activities; construction monitoring for ground disturbing or intrusive activities to address the possibility that MEC remains in the subsurface; and restrictions against residential use.

## **2.14. Selected Remedy**

### **2.14.1. Summary of the Rationale for the Selected Remedy**

Each alternative developed for the Parker Flats MRA was assessed against the nine EPA evaluation criteria described in Table 3. Using the results of this assessment, the Army compared the alternatives and selected a remedy for the Parker Flats MRA. The remedy that best meets the nine EPA evaluation criteria is Remedial Alternative 2 (Land Use Controls). This remedy was selected because LUCs will be protective of human health for all future land users, and would be effective in the short- and long-term at

mitigating the risk to workers conducting ground disturbing or intrusive activities from MEC that is potentially present. This remedy will require a low level of effort to implement, a moderate level of effort to administer over time, and would be cost effective. The remedy can be implemented in a manner consistent with Federal and State guidance. The Army has determined that there were no potential Federal or State ARARs that relate to LUCs at the Parker Flats MRA. While the Army does not consider California laws and regulations concerning Land Use Covenants to be potential ARARs, after the Parker Flats MRA ROD is signed, the Army will enter into State Land Use Covenants that document the land use restrictions selected as part of the remedy. Although the DTSC and EPA Region IX disagree with the Army's determination that California laws and regulations concerning Land Use Covenants are not potential ARARs, they will agree-to-disagree on this issue if the Army signs State Land Use Covenants acceptable to the DTSC.

The Army and EPA have jointly selected the remedy. The DTSC has had an opportunity to review and comment on the ROD.

Community acceptance is discussed in the Responsiveness Summary (Section 3.). The selected remedy is further described below.

#### **2.14.2. Description of the Selected Remedy**

Remedial Alternative 2—Land Use Controls, is the selected remedy for the Parker Flats MRA. These LUCs and their implementation strategy are described below.

##### **Land Use Controls**

The LUCs that will be implemented at the Parker Flats MRA include: (1) MEC recognition and safety training for workers that will conduct ground disturbing or intrusive activities, (2) construction monitoring for ground disturbing or intrusive activities to address MEC that potentially remains in the subsurface, and (3) restrictions against residential use.

##### ***MEC Recognition and Safety Training***

For the eight land use areas within the Parker Flats MRA addressed by this ROD, ground disturbing or intrusive activities are expected to occur. People conducting such activities will be required to attend the "MEC recognition and safety training" to increase their awareness of and ability to recognize MEC. Prior to conducting any planned ground disturbing or intrusive activities, the landowner will be required to notify the Army or the Army's representatives to arrange for MEC recognition and safety training. This training will be provided to all workers that are to perform ground disturbing or intrusive activities.

As part of the five-year review, the Army or its representatives would assess whether the training program should continue. If experience indicates that MEC has not been encountered during ground disturbing or intrusive activities within the area, the program may, with regulatory approval, be discontinued. However, it may be subject to reinstatement should MEC be encountered in the future.

##### ***Construction Monitoring***

Construction monitoring will be provided by UXO-qualified personnel during any ground disturbing or intrusive activities at the Parker Flats MRA to address potential explosive safety risks posed by MEC to construction personnel. Construction monitoring will be arranged during the planning stages of a construction project, prior to the start of any ground disturbing or intrusive activities. UXO-qualified personnel will monitor ground disturbing and intrusive construction activities for the potential presence of MEC. During ground disturbing activities, if MEC is encountered, ground disturbing activities in the area



and adjacent areas will cease and the encounter will be reported to local law enforcement. The local law enforcement agency will promptly request DoD support for response (e.g., an EOD unit). After the response, the Army will reassess the probability of encountering MEC. If the probability of encountering MEC remains low, construction may resume with construction monitoring. If the probability is determined to be moderate or high, then MEC removal will be conducted in the construction footprint before construction can resume.

Construction monitoring may be applicable in the short-term during development or in the long-term after established use. The Army will notify the regulatory agencies, as soon as practicable, of any MEC-related data identified during use of the property, and report the results of monitoring activities annually. The Army will also conduct five-year reviews.

As part of the annual monitoring and five-year review reporting, the Project Team (the Army, EPA, and DTSC) would review MEC-related data collected during the property's development to determine whether construction monitoring should continue. If experience indicates that MEC has not been encountered during development or use of an area, construction monitoring may, with regulatory approval, be discontinued. However, it may be subject to reinstatement if MEC is encountered in the future.

#### ***Restrictions Against Residential Use***

As described in Section 2.12., based on the Remedial Investigation/Feasibility Study, the Army's position is that the additional layer of protection provided by a residential use restriction is not necessary for the Parker Flats MRA; however, in consideration of regulatory input, the preferred remedial alternative includes a LUC prohibiting residential use. For the purpose of this ROD, residential use includes, but is not limited to: single family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (*Army, 2007b*). Any proposal for residential development in the Parker Flats MRA will be subject to regulatory review. It should be noted that, per the Fort Ord Base Reuse Plan (*FORA, 1997*), only the "development reserve" (Reuse Areas 5a and 5b on Plate 2 and Table 2) could include residential development as a potential future use.

#### **Land Use Control Implementation Strategy**

The performance objectives for the LUCs that are selected as part of the remedy are the following:

- **MEC recognition and safety training:** (1) to ensure that land users involved in ground disturbing or intrusive activities are educated about the possibility of encountering MEC, and (2) to ensure that land users involved in ground disturbing or intrusive activities stop the activity when encountering MEC and report to the appropriate authority.
- **Construction monitoring:** to ensure projects involving ground disturbing or intrusive activities are coordinated with UXO-qualified personnel so discoveries of potential MEC items will be handled appropriately.
- **Restrictions against residential use:** to ensure that any proposals to allow residential development or modifications to residential restrictions are approved by EPA in coordination with DTSC.

LUCs will be maintained until EPA and DTSC concur that the land use may be conducted in a manner protective of human health and the environment without the LUCs. This concurrence may be based on:

- 1) New information (e.g. limited geophysical mapping, site development); or

- 2) Where the depth of soil disturbance related to ground disturbing or intrusive activities is sufficient to address the uncertainty of MEC remaining in the subsurface and any MEC encountered during such activities is removed.

The selected LUCs will be explained in more detail in the RD/RAWP. The RD/RAWP will also include plans for implementing, monitoring, and enforcing the selected LUCs. As part of the implementation plan, the RD/RAWP will also describe the following long-term management measures:

- **Deed restriction:** At the time of property transfers, the Army will document the selected LUCs in the Federal deed. If a property has already been transferred at the time this ROD is signed, that deed will be modified, if necessary, to be consistent with the final remedy. The Federal deed will (1) notify future property owners that MEC was found and removed from the area; (2) inform future property owners about the selected remedy; and (3) outline appropriate procedures to be followed in the event that MEC is encountered.
- **Covenants to Restrict Use of Property (CRUPs):** At the time of property transfer, the Army will enter into a CRUP with the State of California (State) that will document the land use controls that are selected as part of the remedy. If an executed CRUP exists for any of the property at the time this ROD is signed, that CRUP will be modified, if appropriate, to be consistent with the final remedy. The applicability of and requirements for CRUPs are described in California Code of Regulations Section 67391.1 and California Civil Code Section 1471.
- **Annual monitoring and reporting:** After this ROD is signed, the Army will perform annual monitoring. The Army will notify the regulatory agencies, as soon as practicable, of any MEC-related data identified during use of the property, and report the results of monitoring activities annually. The Army will evaluate the protectiveness of the remedy as part of the five-year reviews.
- **Five-year review reporting:** Five-year reviews will be conducted in accordance with CERCLA Section 121(c) and Section 27 of the Fort Ord FFA. The five-year review will evaluate the protectiveness of the selected remedy. Based on the evaluation, the selected LUCs may be modified or discontinued, with the approval of the EPA and DTSC.

The standard procedure for reporting any encounter with a known or suspected military munitions (UXO, DMM) item in transferred former Fort Ord property is to report the encounter immediately to local law enforcement. The local law enforcement agency will promptly request DoD support for response (e.g., an EOD unit). After the response, the Army will reassess the probability of encountering MEC. If the probability of encountering MEC remains low, construction may resume with construction monitoring. If the probability is determined to be moderate or high, then MEC removal will be conducted in the construction footprint before construction can resume. The Army will notify the regulatory agencies, as soon as practicable, of any MEC-related data identified during use of the property, and report the results of monitoring activities annually. The Army will also conduct five-year reviews. If, upon such review, any additional evaluation or work, or modification of the remedy is proposed, the Army will submit the proposal to EPA and DTSC for consultation, consistent with Section 27.2 of the FFA.

The Army is the lead agency responsible for the implementation and maintenance of the selected remedy to ensure that it remains protective. The Army will utilize the annual monitoring and five-year review programs as mechanisms to monitor and maintain the protectiveness of the selected land use controls. The Army will enforce the land use controls embodied in the Federal deed(s) and work with the State and local officials to assure that other mechanisms remain effective. Although the Army may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain the ultimate responsibility for remedy integrity. Future

landowners will have responsibilities to act in accordance with the land use controls as specified in the deed(s).

Pursuant to Section 8.3 of the FFA, within 21 days of issuance of this ROD, the Army will submit to EPA and DTSC proposed deadlines for submitting the RD/RAWP. The RD/RAWP will be subject to EPA and DTSC review in accordance with the FFA, and will include implementation and maintenance actions, and periodic inspections.

### **2.14.3. Summary of the Estimated Remedy Costs**

For those alternatives whose life-cycle is indeterminate or exceeds 30 years, for the purposes of evaluating and comparing alternatives as specified in EPA's Remedial Investigation/Feasibility Study Guidance (EPA, 1989), a period of 30 years is used for estimating long term O&M costs. For the Parker Flats MRA reuse areas, the life-cycle is indeterminate; therefore, long term O&M costs were estimated over a period of 30 years. Capital and long term O&M costs for implementing and maintaining Land Use Controls under Remedial Alternative 2 are estimated at a total of approximately \$995,000 for all eight reuse areas within the Parker Flats MRA. Capital and long term O&M costs for implementing and maintaining Long Term Management Measures are estimated at approximately \$258,000 for the reuse areas within the Parker Flats MRA. Therefore, the total estimated 30-year Net Present Value cost of the remedy is approximately \$1.25 million. Long term O&M costs are based on a 2.3 percent real interest rate for Years 1-7 (assumed duration for development and construction), and a 2.8 percent real interest rate for Years 8-30 (established reuse). A detailed, activity-based breakdown of the estimated costs associated with implementing and maintaining the remedy is provided in the Parker Flats MRA Feasibility Study (Volume III; MACTEC, 2006).

### **2.14.4. Expected Outcomes of Selected Remedy**

The expected outcomes of Remedial Alternative 2 would be protection of human health and the environment through implementation of Land Use Controls that will be maintained by the developer/property owner to protect subsequent landowners and reusers conducting ground disturbing or intrusive activities on the property.

If residential development is planned for any part of the Parker Flats MRA included in this ROD, the plans will be subjected to regulatory review.

### **2.15. Statutory Determinations**

The selected remedy satisfies the requirements of Section 121 of CERCLA:

- **Protection of Human Health and the Environment:** The selected remedy provides protection for both human health and the environment through implementation of LUCs to mitigate the risk from MEC that potentially remains present.
- **Compliance with Applicable or Relevant and Appropriate Requirements:** Although the Army determined that there were no potential Federal or State ARARs that relate to LUCs at the Parker Flats MRA, the remedy can be implemented in a manner consistent with Federal and State guidance. While the Army does not consider California laws and regulations concerning Land Use Covenants to be potential ARARs, after the Parker Flats MRA ROD is signed, the Army will enter into State Land Use Covenants that document the land use restrictions selected as part of the remedy. Although the DTSC and EPA Region IX disagree with the Army's determination that California laws and

regulations concerning Land Use Covenants are not potential ARARs, they will agree-to-disagree on this issue if the Army signs State Land Use Covenants acceptable to the DTSC.

- **Cost Effectiveness:** The selected remedy is a cost-effective solution for reducing the risks to human health and the environment. The net present value of the total estimated costs (including Long Term Management Measures costs of \$258,000) are approximately \$258,000 for the No Action alternative (Alternative 1), and approximately \$1.25 million (including Long Term Management Measures costs of \$258,000) for the selected remedy of Land Use Controls (Alternative 2), which is well below the estimate for Additional MEC Remediation (Alternative 3) of approximately \$18.39 million (including Long Term Management Measures costs of \$258,000). In addition, costs for Alternative 3 may be higher than estimated because: (1) after additional MEC remediation is completed, these areas would require a re-evaluation of potential risk from MEC; and (2) the areas are likely to continue to require additional risk mitigation measures (e.g., LUCs) to protect human health during development and long-term reuse.
- **Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable:** The principal threats at the Parker Flats MRA have already been treated (i.e., MEC removal actions have been completed) utilizing permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.
- **Preference for Treatment as a Principal Element:** The principal threats at the Parker Flats MRA have already been treated (i.e., MEC removal actions have been completed), satisfying the statutory preference for treatment as a principal element (i.e., reducing the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).
- **Five-Year Review Requirements:** Because the selected remedy may result in MEC potentially remaining within the Parker Flats MRA, a statutory review will be conducted within five years after initiation of the remedial action to ensure the remedy is, or will be, protective of human health and the environment. The purpose of a five-year review is to gather updated information, evaluate the condition of the site, and determine if the site remains safe from any contamination that might be left at the site. The next five-year review will occur in 2012.

## **2.16. Documentation of Significant Changes from Preferred Alternative of Proposed Plan**

As described in Section 2.4., the Proposed Plan for the Parker Flats MRA was released for public comment on February 9, 2007, and a public meeting was held on March 1, 2007. This Proposed Plan identified a preferred remedial alternative for the Parker Flats MRA. Comments collected over the public review period between February 15 and March 17, 2007, did not necessitate any significant changes to the conclusions or procedures outlined in the Parker Flats MRA Remedial Investigation/Feasibility Study and Parker Flats MRA Proposed Plan.

### **3. RESPONSIVENESS SUMMARY**

#### **3.1. Overview**

In the *Final Parker Flats Munitions Response Area Remedial Investigation/Feasibility Study, Former Fort Ord, California*, dated August 31, 2006, and updated in the Proposed Plan for the Parker Flats MRA, dated February 9, 2007, the Army identified a preferred remedial alternative, which consists of Land Use Controls (LUCs), including:

- MEC recognition and safety training for workers;
- Construction monitoring for ground disturbing or intrusive activities; and
- Restrictions against residential use.

In addition, Long Term Management Measures considered as implementation and management aspects of the remedial alternatives, rather than specific mitigation measures, will also be implemented, including a deed restriction, CRUPs, annual monitoring and reporting, and five-year review reporting.

#### **3.2. Summary of Comments Received During the Public Comment Period and Department of the Army Responses**

Public comments submitted during the Parker Flats MRA Proposed Plan public comment period and the Army's responses are summarized below.

Comments were received from the public: (1) at the public meeting held on March 1, 2007; and (2) in two written comments received during the 30-day public comment period from February 15 to March 17, 2007. One of the comment letters was from the Association of Monterey Bay Area Governments (AMBAG) Board of Directors stating that they reviewed the Proposed Plan and have no comments. The other letter was from the Fort Ord Environmental Justice Network (FOEJN) and their technical advisor with Environmental Stewardship Concepts (ESC).

**Comment 1:** A general comment was made that the overall process being followed by the Army for the Track 2 sites is not clear to some members of the community, including how the proposed Agreed Order on Consent between the EPA and FORA would affect the cleanup process by transferring property to the control of the FORA.

**Response 1:** The Proposed Plan described the Army's proposed munitions response remedy for the Parker Flats MRA. The Army will address other Track 2 MRSS in site-specific Remedial Investigation/Feasibility Studies and resulting Records of Decision. The Administrative Order on Consent (AOC) is an agreement between the regulatory agencies and FORA, regarding the performance of certain cleanup activities by FORA at the former Fort Ord. The AOC does not affect the evaluation of remedial alternatives nor the selection of the remedy for the Parker Flats MRA. Comments regarding the AOC do not pertain to the Proposed Plan and should be directed to FORA.

**Comment 2:** A comment was made that an additional removal action should be performed at the proposed veteran's cemetery reuse area, because this area would be reused in a manner that would involve the most widespread and frequent intrusions into the soil. The comment suggested the previous removal actions conducted and detection equipment used by the Army in this reuse area did not extend deep enough or identify all potential MEC that may be present. A question was raised about the length of

construction monitoring in this area, when an additional removal action could provide better assurances regarding the risk from MEC that potentially remains, rather than long term monitoring.

**Response 2:** MEC removals to four feet bgs were conducted at the Parker Flats MRA. At the time the removal action was conducted, QC was completed according to the approved work plan and Quality Assurance (QA) was conducted by USACE. Additional site validation was performed during the review of the Track 2 Remedial Investigation/Feasibility Study for the Parker Flats MRA (see also Response to Comment 3 below). However, the Army recognizes that MEC detection at the Parker Flats MRA could not be shown to be 100 percent accurate and there are use limitations where the ground surface is obstructed by pavement or other structures. Therefore, to manage the risk to future land users from MEC that potentially remains in the property, remedial action alternatives were evaluated for the Parker Flats MRA.

The Army and regulatory agencies have determined that development and reuse at the Parker Flats MRA, including the veteran's cemetery area, can occur safely with the selected remedy (i.e., LUCs) that includes MEC recognition and safety training for workers conducting ground disturbing or intrusive activities; construction monitoring for ground disturbing or intrusive activities; and restrictions against residential use.

**Comment 3:** A comment was made that additional QA/QC testing should be performed at the Parker Flats MRA before the property is released to the public, because previous QA/QC results do not indicate these areas are safe for public use.

**Response 3:** The Parker Flats MRA Remedial Investigation indicated that MEC removals to four feet bgs were conducted in the entire site except where the ground surface is obstructed by pavement or other structures, and all detected MEC was removed. Following the MEC removal actions at the Parker Flats MRA, QC surveys were completed over 10 percent of each grid to evaluate the quality of the removal action. If additional anomalies were discovered during the QC survey, they were investigated and removed as appropriate. Of the 5,164 grids surveyed, only 15 grid failures occurred. These grids were reswept. Following the quality control survey, a QA survey was conducted over an additional 10 percent of the site. No quality assurance failures occurred during the Parker Flats removal action.

In response to an agency request during the review of the Remedial Investigation/Feasibility Study, an additional site validation effort was performed by Parsons under the direction of the USACE. The field activities were also supervised by UXO-qualified personnel from EPA and DTSC. This site validation was performed on portions of four 100 by 100 foot grids within the Parker Flats MRA and included a site walk in the remainder of the southern portion of the Parker Flats MRA. The work was completed between November 1 and 3, 2005. A memorandum describing the results of the survey is included in the final Remedial Investigation/Feasibility Study.

The grid search covered approximately 25 percent of each of four previously cleared grids. A Schonstedt GA52Cx was used to search the site for anomalies. The areas in which the grids were located were selected by DTSC. One pound of MD was found in each of two grids. One pound of cultural debris (nails, wire) was found within one of the grids where MD was found. No MEC was found in any of the grids.

The site walk meandered throughout the southern part of Parker Flats and covered approximately 6.2 miles. A Schonstedt GA52Cx was used during the site walk to identify subsurface anomalies present along the path. A total of 83 anomalies were identified and excavated along the path. Twenty-six anomalies resulted in discovery of MD. MD items found at these anomaly locations included: ten small arms items, two empty ammo cans (found together), nine fragments, two expended pyrotechnic debris,

three pieces of M125 series illumination signals, and one expended MK II practice hand grenade. The remaining anomalies consisted of range related debris and cultural debris. No MEC was identified during the grid search or site walk.

In December 2005 and January 2006, DTSC also conducted a digital survey and intrusive anomaly investigation in the validation areas. No MEC was found during these additional investigations. This information is included in the final Remedial Investigation/Feasibility Study.

The Army recognizes that MEC detection at the Parker Flats MRA could not be shown to be 100 percent accurate and there are use limitations where the ground surface is obstructed by pavement or other structures. Therefore, to manage the risk to future land users from MEC that potentially remains in the property, remedial action alternatives were evaluated for the Parker Flats MRA reuse areas in the Parker Flats MRA, and LUCs was selected as the remedy to address the risks. These include MEC recognition and safety training for workers conducting ground disturbing or intrusive activities; construction monitoring for ground disturbing or intrusive activities; and restrictions against residential use. A RD/RAWP will describe plans for implementing and monitoring the selected LUCs for the Parker Flats MRA.

**Comment 4:** A comment was made that soil sampling for metals and chemical warfare agent residues and breakdown products should be performed within the Parker Flats MRA to determine whether they are present as a result of military munitions use. It is uncertain whether heavy metals are present at concentrations that would require remedial action.

**Response 4:** The MEC removal actions conducted at the Parker Flats MRA were designed to address explosives safety. However, in the course of the removal action, if hazardous wastes were identified they were removed and disposed of following the appropriate requirements. After the waste material was inspected, the non-hazardous debris was removed or reburied. The Track 2 Parker Flats MRA Remedial Investigation/Feasibility Study only addresses the physical, explosives risk from MEC. The potential soil contamination and associated chemical risks are being addressed under the Basewide Range Assessment program (*IT, 2001*). Site reconnaissance and soil sampling was conducted within the Parker Flats MRA as part of the Basewide Range Assessment program. The Basewide Range Assessment for the Parker Flats MRA included a literature review for all of the MRS sites within the Parker Flats MRA and site reconnaissance within MRS-3, MRS-4B, MRS-13B, MRS-37, MRS-50, MRS-53, and MRS-55. Following reconnaissance, soil samples were collected from MRS-3, MRS-37, MRS-50, MRS-53, and MRS-55. Samples were analyzed for explosives and perchlorate. Selected samples were also analyzed for lead, copper, antimony, semi-volatile organic compounds and total petroleum hydrocarbons as gasoline, diesel, and motor oil. The results of this sampling are provided in the Comprehensive Basewide Range Assessment Report (*Shaw/MACTEC, 2006*). No further action related to chemical contamination in soil was recommended for the MR sites within the Parker Flats MRA.

**Comment 5:** A concern was raised about the need for and length of MEC recognition and safety training for the public, and that there would be assurances the training would be offered and implemented in the long term.

**Response 5:** The remedial LUCs are intended to be in place indefinitely unless periodic reviews indicate that the safety programs are no longer necessary.

#### 4. REFERENCES

Department of Defense Explosives Safety Board (DDESB), 2004. *Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel*. DDESB TP 18. December 20.

Department of Toxic Substances Control (DTSC), 2006a. Letter to the U.S. Army, Fort Ord BRAC Environmental Coordinator regarding comments on the Draft version of the *Superfund Proposed Plan, Remedial Action is Proposed For Parker Flats Munitions Response Area, Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California*. July 26.

\_\_\_\_\_, 2006b. Letter to the U.S. Army, Fort Ord BRAC Environmental Coordinator regarding comments on the Draft Final version of the *Superfund Proposed Plan, Remedial Action is Proposed For Parker Flats Munitions Response Area, Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California*. October 18.

Fort Ord Reuse Authority (FORA), 1997. *Fort Ord Base Reuse Plan*. March.

Harding ESE (now MACTEC), 2002. *Draft Final Technical Memorandum, Evaluation of Vegetation Clearance Methods, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. October.

Harding Lawson Associates (HLA; now MACTEC), 2000a. *Draft Final Literature Review Report Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. Report prepared for the Department of the Army, Corps of Engineers, Sacramento District (USACE). January 4.

\_\_\_\_\_, 2000b. *Final Plan for Evaluation of Previous Work, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. Report prepared for USACE. December 4.

IT Corporation (IT), 2001. *Basewide Range Assessment Work Plan and Contractor Quality Control Plan, Small Arms and Multi-Use Ranges, Fort Ord, California*. January.

MACTEC Engineering & Consulting, Inc. (MACTEC; formerly Harding ESE and HLA), 2003. *Track 2 Data Quality Objectives Technical Memorandum*.

\_\_\_\_\_, 2006. *Final Track 2 Munitions Response Remedial Investigation/ Feasibility Study, Former Fort Ord, California*. Report prepared for the Department of the Army, Corps of Engineers, Sacramento District. August 31.

Malcolm-Pirnie, 2002. *Final Fort Ord Ordnance and Explosives Risk Assessment Protocol*. October.

\_\_\_\_\_, 2005. *Munitions and Explosives of Concern (MEC) Risk Assessment, Parker Flats MRA, Former Fort Ord, California*. December.

Shaw E&I (Shaw)/MACTEC, 2006. *Draft Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1C*. November 24.

U.S. Army Corps of Engineers (USACE), 2000. *Ordnance and Explosives, Remedial Investigation/Feasibility Study Work Plan, Former Fort Ord, Monterey County, California*. Draft Final. May 15.



- \_\_\_\_\_, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP)*. April. With technical assistance from Jones and Stokes Associates, Sacramento, California.
- \_\_\_\_\_, 1995. *Site Use Management Plan (SUMP) for Land Transfer and Reuse of the Multi-Range Area, Fort Ord, California*. Prepared by U.S. Army and U.S. Department of the Interior, Bureau of Land Management. July 25.
- U.S. Army Engineer Division, Huntsville (USAEDH), 1997. *Draft Revised Archives Search Report, Former Fort Ord, California. Monterey County, California*. Prepared by U.S. Army Corps of Engineers, St. Louis District.
- U.S. Department of the Army (Army), 2007a. *Superfund Proposed Plan: Remedial Action is Proposed for Parker Flats Munitions Response Area, Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord*. February 9.
- \_\_\_\_\_, 2007b. *Finding of Suitability for Early Transfer (FOSET), Former Fort Ord, California, Environmental Services Cooperative Agreement (ESCA) Parcels and Non-ESCA Parcels (Operable Unit Carbon Tetrachloride Plume) (FOSET 5)*. June.
- U.S. Environmental Protection Agency (EPA), 2006. Letter to the U.S. Army, Fort Ord BRAC Environmental Coordinator regarding comments on the Draft Final version of the *Superfund Proposed Plan, Remedial Action is Proposed For Parker Flats Munitions Response Area, Track 2 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord, California*. October 16.
- \_\_\_\_\_, 1995. *Land Use in the CERCLA Remedy Selection Process*. OSWER Directive No. 9355.7-04. May.
- \_\_\_\_\_, 1989. *Guidance for Conducting Remedial Investigation/Feasibility Studies Under CERCLA. Interim Final*. EPA 540/G-89/001. October.
- Zander Associates, 2002. *Assessment, East Garrison—Parker Flats Land Use Modifications, Fort Ord, California*. May.

## TABLES

**Table 1. Summary of Munitions Response Site (MRS) Investigations  
Record of Decision, Parker Flats Munitions Response Area,  
Former Fort Ord, California**

MRS Site Number	Site Acreage*	Site Name	Past Use	Current or Proposed Reuse	Site Investigation Status**
3	9.97	Range 49, Old Demolition area	Landmine warfare, anti-armor, and Molotov cocktail training area (Practice and training munitions)	Habitat reserve area	MEC removal to four feet bgs complete
4B	7.05	CBR Training Area	Chemical, biological, and radiological defense training (Simulated training)	Horse park	MEC removal to four feet bgs complete
13B	165.56	Practice Mortar Range	Mortar practice (Practice and training munitions)	Army maintenance center, public transit facilities, CSUMB expansion, horse park	MEC removal to four feet bgs complete except in areas covered with asphalt
27A	30.64	Training Site 1	General maneuvers, and bivouac (Camping and overnight training) (Flares, smoke producing items, simulators)	Horse park	MEC removal to four feet bgs complete within Parker Flats MRA
27B	29.69	Training Site 2	General maneuvers, and bivouac (Camping and overnight training) (Flares, smoke producing items, simulators)	Horse park	MEC removal to four feet bgs complete within Parker Flats MRA
27G	10.57	Training Site 3	General maneuvers, and bivouac (Camping and overnight training) (Flares, smoke producing items, simulators)	Emergency vehicle operating center, habitat reserve	MEC removal to four feet bgs complete within Parker Flats MRA
37	48.7	Parker Flats Mortar Range	Firing practice mortars (dry-fire); included in OE-55, (Practice mortars, projectiles)	Habitat reserve	MEC removal to four feet bgs complete
40	1.72	Parker Flats (Tear) Gas House	Tear gas agent training facility	Cemetery	MEC removal to four feet bgs complete
50/50 EXP	131.78	Artillery Hill	Rifle grenade target area, general maneuvers (Primarily practice munitions and projectiles)	Development reserve, cemetery, emergency vehicle operating center	MEC removal to four feet bgs complete
52	20.13	Rifle Grenade and Projectile Target Area	Target area (Primarily practice munitions and projectiles)	Horse park, habitat reserve	MEC removal to four feet bgs complete
53/53 EXP	227.59	Shoulder-Launched Projectile Area	Rifle grenade target area; contains TS-7, general maneuvers, (Primarily practice munitions and projectiles)	Emergency vehicle operating center, habitat reserve, horse park	MEC removal to four feet bgs complete

**Table 1. Summary of Munitions Response Site (MRS) Investigations  
Record of Decision, Parker Flats Munitions Response Area,  
Former Fort Ord, California**

<b>MRS Site Number</b>	<b>Site Acreage*</b>	<b>Site Name</b>	<b>Past Use</b>	<b>Current or Proposed Reuse</b>	<b>Site Investigation Status**</b>
54EDC	12.82	Canyon Target Area	Possible target area, general maneuvers (Primarily practice and training munitions)	Habitat reserve	MEC removal to four feet bgs complete
55 (includes portions of MRS-27A and MRS-27B)	65.55	Parker Flats (including TS-1 and TS-2)	Range for hand and rifle grenades, shoulder-launched projectiles, general maneuvers (Primarily practice and training munitions)	Horse park, habitat reserve	MEC removal to four feet bgs complete

\* The acreage is of the entire MRS site. The Parker Flats MRA contains only portions of some of the MRS Sites. For example, only a small portion of MRS-27A is included in the Parker Flats MRA.

\*\* These MEC removal actions were designed to address MEC to depths of four feet below ground surface (bgs); however, all anomalies (i.e., ferromagnetic material), even those deeper than four feet bgs, were investigated and all detected MEC was removed.

**Table 2. Summary of Parker Flats MRA Reuse Areas  
Record of Decision, Parker Flats Munitions Response Area,  
Former Fort Ord California**

Reuse Area*	Acres	Planned Reuse
1. Monterey Peninsula College Emergency Vehicle Operations Center (EVOC)	221.5	College for training of law enforcement personnel
2a. MRS-13B Monterey Horse Park	182.9	Stable and horse riding facility with RV camping area
2b. Parker Flats MRA Monterey Horse Park		
3. Parker Flats MRA Habitat Reserve Area	147.8	Oak woodland and maritime chaparral habitat reserve
4. Veterans Cemetery	102.1	Cemetery for interment of veterans
5a. MRS-13B Development Reserve	36.2	Development reserve for Monterey County and City of Seaside; may include residential development
5b. Parker Flats MRA Development Reserve		
6. Monterey County Public Facilities	3.0	Development for Monterey County
7. Army Maintenance Center	35.5	Retained by Army for facility maintenance
8a. Monterey-Salinas Transit (MST) Facility Maintenance Center	27.0	Parking lot and maintenance facility for commuter vehicles
8b. MST Facility Park & Ride		

\* The Reuse Areas by number (1 through 8b) are identified on Plate 2. This table does not include the following two reuse areas shown on Plate 2: (1) the CSUMB Expansion parcel; and (2) the MRS-13B Habitat parcel. The approximately 2 acres that comprise these parcels will be addressed in a different decision document in conjunction with adjacent parcels.

**Table 3. Summary of Remedial Alternatives Evaluation**  
**Record of Decision, Parker Flats Munitions Response Area, Former Fort Ord California**

REMEDIAL ALTERNATIVE	EPA's 9 CERCLA EVALUATION CRITERIA							
	Threshold Criteria		Balancing Criteria					Model
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of T, M, V Through Treatment	Implementability	Cost*	State Acceptance
No Further Action	Not protective; does not mitigate potentially remaining MEC risks to intrusive workers	No ARARs were identified for this alternative	No MEC risk mitigation measures	No MEC risk mitigation measures	None; although MEC removals have been conducted	Not administratively feasible	No costs	Not acceptable
Land Use Controls	Protective; mitigates potentially remaining MEC risks to intrusive workers	No ARARs were identified for this alternative	MEC recognition and safety training & construction monitoring would be required during intrusive activities	MEC recognition and safety training & construction monitoring would be required during intrusive activities	No further reduction; MEC removals have been conducted	Administratively feasible Low level of effort to implement Moderate level of effort to maintain and administrate over time	\$995,000	Accepted as the preferred alternative
Additional MEC Remediation	Would be determined after investigation is complete and MEC risks are reevaluated	Would be implemented using methods that comply with ARARs	Would be determined after investigation is complete and MEC risks are reevaluated	Would be determined after investigation is complete and MEC risks are reevaluated	If MEC is found	Administratively feasible High level of effort to implement from a technical perspective	\$18,129,000	Not selected

Acronyms

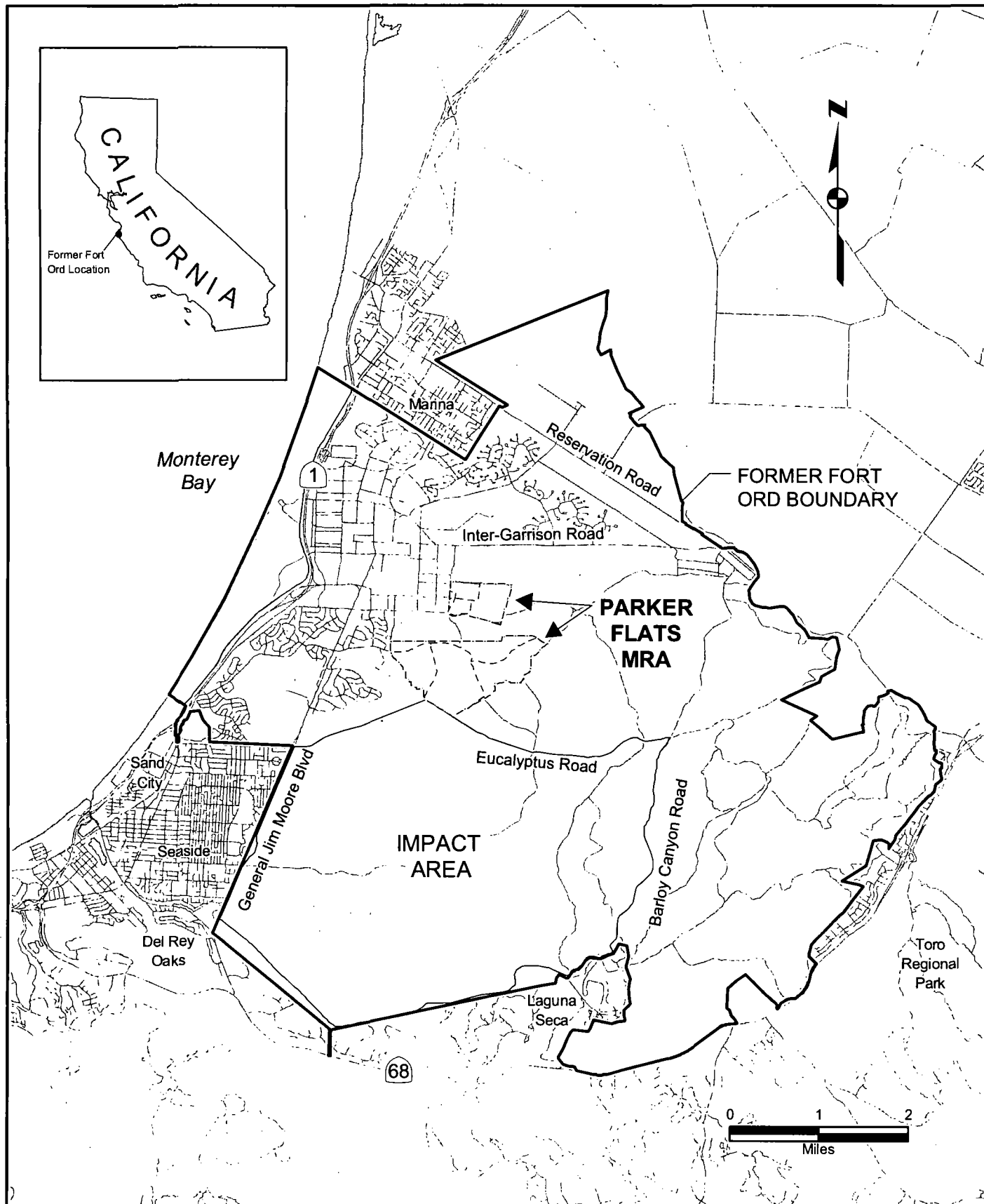
ARARs = Applicable or Relevant and Appropriate Requirements

MEC = munitions and explosives of concern

T, M, V = toxicity, mobility, volume

Footnotes \* These costs are in addition to an estimated \$258,000 for Long Term Management Measures (Deed Notice, Annual Monitoring & Reporting, 5-Year Review Reporting) for the entire area.

## PLATES



UNITED STATES  
DEPARTMENT OF THE ARMY

**Parker Flats MRA and Fort Ord Location Map**  
Record of Decision  
Parker Flats Munitions Response Area  
Track 2 Munitions Response Site  
Former Fort Ord, California

PLATE

**1**

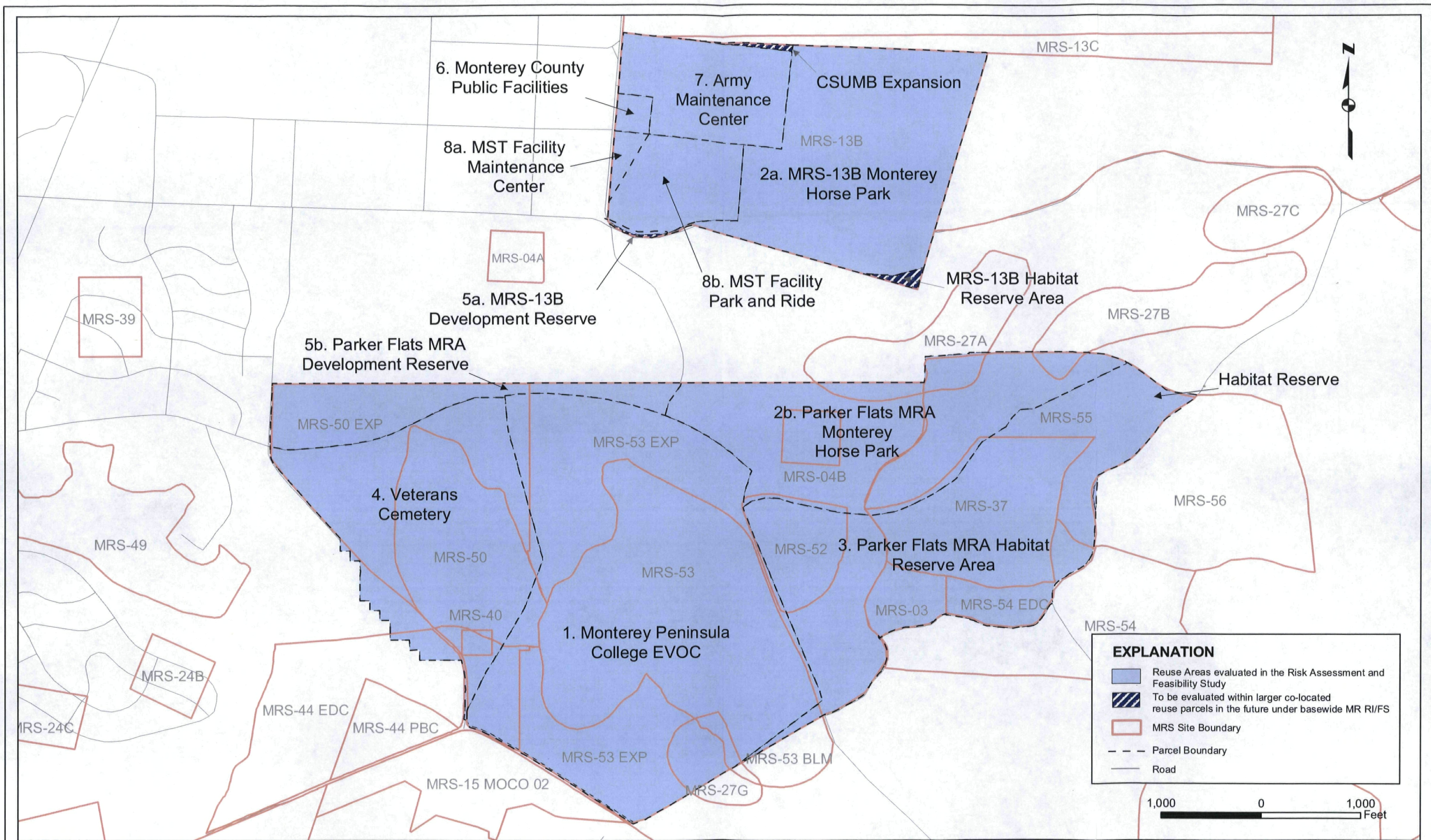
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JOB NUMBER  
4088053153 14.4

CHECKED  
CHECKED DATE  
8/2007

APPROVED  
APPROVED DATE





DESIGNED:	PROJECT NO: 4088053153 14.4
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DATE:	DATE: 8/2007

UNITED STATES  
DEPARTMENT OF THE ARMY

Record of Decision - Parker Flats Munitions Response Area  
Track 2 Munitions Response Site  
Former Fort Ord, California

Parker Flats MRA Reuse Areas  
and Munitions Response Sites

PLATE:

2



## **APPENDIX A**

### **GLOSSARY OF MUNITIONS RESPONSE PROGRAM TERMS**

## APPENDIX A

### Glossary of Munitions Response Program Terms

**Administrative Record** – A compilation of all documents relied upon to select a remedial action pertaining to the investigation and cleanup of Fort Ord. *Source:* (2).

**After Action Report (AAR)** – A report presenting the results of MEC investigation, sampling and/or removal actions conducted at a site pertaining to the investigation and cleanup of Fort Ord. *Source:* (2).

**Closed Range** – A military range that has been taken out of service and either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component. *Source:* (3).

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, otherwise known as Superfund)** – A Federal law that addresses the funding for and cleanup of abandoned or uncontrolled hazardous waste sites. This law also establishes criteria for the creation of decision documents such as the RI, FS, Proposed Plan, and ROD. *Source:* (2).

**Discarded Military Munitions (DMM)** – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2)). *Source:* (6).

For the purposes of the basewide Munitions Response Program being conducted at the former Fort Ord, DMM does not include small arms ammunition .50 caliber and below.

**Engineering Control (EC)** – A variety of engineered remedies to contain and/or reduce contamination, and/or physical barriers intended to limit access to property. Some examples of ECs include fences, signs, guards, landfill caps, soil covers, provision of potable water, slurry walls, sheet pile (vertical caps), pumping and treatment of groundwater, monitoring wells, and vapor extraction systems. *Source:* (1).

**Expended** – The state of munitions debris in which the main charge has been expended leaving the inert carrier. *Source:* (2).

**Explosive Soil** – Explosive soil refers to mixtures of explosives in soil, sand, clay, or other solid media at concentrations such that the mixture itself is explosive.

- (a) The concentration of a particular explosive in soil necessary to present an explosion hazard depends on whether the particular explosive is classified as “primary” or “secondary.” Guidance on whether an explosive is classified as “primary” or “secondary” can be obtained from the Ordnance and Explosives Mandatory Center of Expertise (OE MCX) or Chapters 7 and 8 of TM 9-1300-214, Military Explosives.
- (b) Primary explosives are those extremely sensitive explosives (or mixtures thereof) that are used in primers, detonators, and blasting caps. They are easily detonated by heat, sparks, impact, or friction. Examples of primary explosives include Lead, Azide, Lead Styphnate, and Mercury Fulminate.
- (c) Secondary explosives are bursting and boosting explosives (i.e., they are used as the main bursting charge or as the booster that sets off the main bursting charge). Secondary explosives are much less sensitive than primary explosives. They are less likely to detonate if struck or when exposed to

friction or electrical sparks. Examples of secondary explosives include Trinitrotoluene (TNT), Composition B, and Ammonium Picrate (Explosive D).

- (d) Soil containing 10 percent or more by weight of any secondary explosive or mixture of secondary explosives is considered "explosive soil." This determination was based on information provided by the USAEC as a result of studies conducted and reported in USAEC Report AMXTH-TE-CR 86096.
- (e) Soil containing propellants (as apposed to primary or secondary high explosives) may also present explosion hazards. (ER 1110-1-8153). *Source* (5).

**Feasibility Study (FS)** – An evaluation of potential remedial technologies and treatment options that can be used to clean up a site. *Source* (2).

**Impact Area** – The impact area consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and North-South Road to the west. *Source*: (2).

**Institutional Control (IC)** – A legal or institutional mechanism that limits access to or use of property, or warns of a hazard. An IC can be imposed by the property owner, such as use restrictions contained in a deed, or by a government, such as a zoning restriction. *Source*: (1).

**Land Use Controls (LUC)** – LUC are physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineering remedies to contain or reduce contamination and/or physical barriers to limit access to real property, such as fences or signs. *Source*: (6).

**Magnetometer** – An instrument used to detect ferromagnetic objects. Total field magnetometers measuring the strength of the earth's natural magnetic field at the magnetic sensor location. Gradient magnetometers, sensitive to smaller near-surface metal objects, use two sensors to measure the difference in magnetic field strength between the two sensor locations. Vertical or horizontal gradients can be measured. *Source*: (2).

**Military Munitions** – Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.

The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, other than non nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)). *Source*: (7).

**Military Munitions Response Program (MMRP)** – DoD-established program to manage the environmental, health and safety issues presented by Munitions and Explosives of Concern (MEC). *Source*: (2).

**Mortar** – Mortars typically range from approximately 1 inch to 11 inches in diameter or larger, and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. *Source:* (1).

**Munitions Constituents (MC)** – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710 (e) (3)). *Source:* (6).

**Munitions Debris** – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarizations, or disposal. *Source:* (7).

**Munitions and Explosives of Concern (MEC)** – Distinguishes specific categories of military munitions that may pose unique explosives safety risks, such as: UXO, as defined in 10 U.S.C. 101 (e) (5); discarded military munitions, as defined in 10 U.S.C. 2710 (e) (2); or munitions constituents (e.g., TNT, Cyclotrimethylene trinitramine [RDX]), as defined in 10 U.S.C. 2710 (e) (3), present in high enough concentrations to pose an explosive hazard. *Source:* (7).

For the purposes of the basewide Munitions Response Program being conducted for the former Fort Ord, MEC does not include small arms ammunition .50 caliber and below.

**MEC Sampling** – Performing MEC searches within a site to determine the presence of MEC. *Source:* (2).

**Munitions Response Area (MRA)** – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples are former ranges and munitions burial areas. A MRA comprises of one or more munitions response sites. *Source:* (7).

**Munitions Response Site (MRS)** – A discrete location within MRA that is known to require a munitions response. *Source:* (7).

**No Further Action** – Determination following a remedial investigation or action that a site does not pose a significant risk and so requires no further activity under CERCLA. *Source:* (2).

**Operating Grids** – Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by Global Positioning System (GPS), marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or OE sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. They are identified sequentially using an alpha-numeric system (e.g., E-5). *Source:* (2).

**Projectile** – An object projected by an applied force and continuing in motion by its own inertia, as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. *Source:* (4).

**Proposed Plan** – A plan that identifies the preferred alternative for a site cleanup, and is made available to the public for comment. *Source:* (2).

**Range-Related Debris** – Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material). *Source:* (6).

**Record of Decision (ROD)** – A report documenting the final action, approved by the regulatory agencies, that is required at Superfund sites. *Source:* (2).

**Remedial Investigation (RI)** – Exploratory inspection conducted at a site to delineate the nature and extent of chemicals, and in this case OE, present at the site. *Source:* (2).

**Removal Depth** – The depth below ground surface to which all ordnance and other detected items are removed. *Source:* (2).

**SiteStats/GridStats** – Programs developed by QuantiTech for the Huntsville Corps of Engineers to predict the density of ordnance on sites with spatially random dispersal of ordnance. *Source:* (2).

**Superfund** – See Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) above.

**Surface Removal** – Removal of MEC from the ground surface by UXO teams using visual identification sometimes aided by magnetometers. *Source:* (2).

**Track 2 Sites** – Track 2 Sites are those where MEC was found and a removal action has been completed. Track 2 sites differ from Track 1 sites in that a removal action has been completed and that land use controls may be applicable based on future identified land uses and results of the removal actions. *Source:* (2).

**Transferred Range** – A military range that is no longer under military control and has been leased, transferred, or returned to another entity, including Federal entities. This includes a military range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. *Source:* (3).

**Transferring Range** – A military range that is proposed to be leased, transferred, or returned from the DoD to another entity, including Federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. An active range will not be considered a “transferring range” until the transfer is imminent. *Source:* (3).

**Unexploded Ordnance (UXO)** – Military munitions that:

- (A) Have been primed, fuzed, armed, or otherwise prepared for action;
  - (B) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materials; and
  - (C) Remain unexploded, whether by malfunction, design, or any other cause. (100 U.S.C. 101 (c)(5)).
- Source:* (7).

For the purposes of the basewide Munitions Response Program being conducted for the former Fort Ord, UXO does not include small arms ammunition .50 caliber and below.

**UXO-Qualified Personnel** – Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist or Senior UXO Supervisor (*DDESB, 2004*).

**Sources:**

- (1) Compendium of Department of Defense Acronyms, Terms, and Definitions: The Interstate Technology and Regulatory Council (ITRC) Work Group (Unexploded Ordnance Work Team), December 2000.
- (2) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.
- (3) Management Guidance for the Defense Environmental Restoration Program published by the office of the Under Secretary of Defense (Installations and Environment), September 2001.
- (4) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.
- (5) Ordnance and Explosives Response Engineer Manual (EM) 1110-1-4009. U.S. Army Corps of Engineers, June 23, 2000.
- (6) Memorandum for the Assistant Chief of Staff for Installation Management, Subject: Munitions Response Terminology. April 21, 2005.
- (7) Federal Register/Volume 70. No. 192/Wednesday, October 5, 2005/Rules and Regulations, 32 CFR Part 179, Munitions Response Site Prioritization Protocol, Department of Defense, Final Rule. October 2005.